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THE ETIOLOGY OF INFANTILE SPASMOPHILIA *

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PHILADELPHIA

It is essential to keep in mind that this discussion will concern itself not with spasmophilia in general but solely with infantile spasmophilia; in other words, with the spasmophilia as it is encountered in infants usually from 6 to 18 months of age.

GENERAL CHARACTERISTICS OF SPASMOPHILIA

Infantile spasmophilia is a symptom complex occurring principally in spring and fall peaks and characterized by a hyperexcitability of the nervous system. It appears either in a latent form, whose principal signs are the Erb and the Chvostek phenomena, or in an active form in which general or local clonic or tonic spasms develop, added to one or both of the latent symptoms mentioned. The Trousseau phenomenon, while sometimes demonstrable during the latent period of spasmophilia, usually is found in infants presenting symptoms of the active stage as well. The active stage frequently is ushered in by other factors than those responsible for the basic latent spasmophilia. Of these, hyperventilation, usually as the result of infection and fever, probably is most commonly responsible and operates by simply making more marked the basic disturbance of the latent stage; namely, the de-ionization of calcium.

Marked hyperventilation alone has been shown by various workers (Grant and Goldman [1], Collip and Backus,[2] Freudenberg and György [3]) to be capable of producing spasmophilic symptoms, but such extreme conditions only on the rarest occasions can be wholly responsible for the development of spasmophilia in infants and young children.

It has been noted for a long time and by many observers that, on the one hand, practically every spasmophilic infant is rachitic and, on the other hand, by no means all rachitic infants are spasmophilic. This finding became more complex when it was discovered that the treatment which cured rickets ultimately also cured spasmophilia. Another similarity was recognized in the practically total disappearance of both conditions during the summer period and another dissimilarity in that spasmophilia appeared in a greater spring and in a lesser fall incidence peak, whereas the occurrence of rickets showed only one peak, which was of a broader type and which developed with the winter months. These two conditions consequently were considered by some authors to be forks of the same disease, by others to be independent conditions and by still others to be a chameleon conundrum.

That growth, diet, age, sex, heredity, activity, disease, housing and climatic conditions influence the development and course of rickets and spasmophilia also has been maintained by a multitude of authors for a great many years. The most thorough and complete presentation of these subjects from all angles exists in the masterful monograph on rickets and spasmophilia by György,[4] in which the voluminous and burdensome literature is given a most comprehensive consideration and recognition and to which the reader is referred for detailed references and information.

MODE OF DEVELOPMENT OF SPASMOPHILIA

Our attention was focused on what we believe to be the logical explanation of the mode of development of infantile spasmophilia by noting the at first unexplainable variation in the effectiveness of different antirachitic agents when applied to infants with rachitic symptoms. In some cases the quartz lamp seemed to excel, in others the carbon arc lamp, and in still others, cod liver oil. The solution of this riddle was at hand when it was appreciated by us that much depended on the kind and degree of rickets under treatment or, to put it in another fashion, whether spasmophilic symptoms were present or not. If the rachitic infant showed spasmophilic symptoms, it was found in practically all the cases that the roentgenograms showed evidences of past or present healing. In such cases, consequently, therapy in some form must have been given, and therefore they might not require, unless rickets developed a second time, as much treatment for roentgenographic healing as would cases of rickets in which treatment had not been given.

In order to evaluate the effectiveness of such previous therapy, and in order also to know whether patients whose roentgenograms on admission showed no dependable signs of healing had or had not been subjected to such previous therapy, it was considered necessary to postpone the regular practice of subjecting rachitic patients with or without spasmophilic symptoms immediately on admission to the influence of antirachitic therapy in any form. As a result of the

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1. Grant, S. B., and Goldman, A.: Am. J. Physiol. **52**: 209 (June) 1920.

2. Collip, J. B., and Backus, P. L.: Am. J. Physiol. **51**: 551 (April) 1920.

3. Freudenberg, E., and György, P.: Jahrb. f. Kinderh. **96**: 5, 1921.

4. Stepp and György: Avitaminosen, Berlin, Julius Springer, 1927.

adoption of this temporary treatment-free period after admission, three very important discoveries were made; namely, that: (1) certain cases did show in the roentgenograms definite evidences of progressive but mild and incomplete healing; (2) in some of these, spasmophilic symptoms developed sooner or later, and (3) in most of those in which such healing and symptoms developed there was a drop in the blood serum calcium level and a rise in the inorganic phosphate level. In other words, it was a fact that typical clinical and blood serum pictures of spasmophilia were seen to be present, or to increase or to develop in rachitic infants showing on admission or within a few weeks thereafter roentgenographic evidence of healing, even though no antirachitic therapy was administered in the hospital.

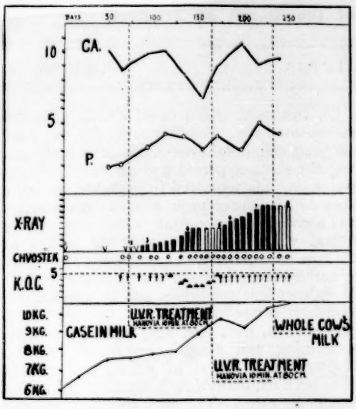

Chart 1 (J. B., white, aged 9 months).—Effect of a single erythema-producing quartz lamp exposure to the front body surface of a rachitic infant with a low inorganic phosphate serum level. After twelve to thirteen days, roentgenographic evidence of healing began and continued to increase slowly to the sixty-seventh day, when it ceased at a 40 per cent healed stage. Coincident with the beginning of the roentgenographic healing, an improvement in the rachitic blood picture occurred, to be followed, however, on the sixtieth day after exposure by the appearance of a definite spasmophilia: (a) drop in calcium level; (b) rise in inorganic phosphate level, and (c) cathodal opening contraction, 3.5 ma. On the eighty-second day the calcium reached the low level of 6.6 and the Erb's phenomenon a cathodal opening contraction of 3.0. On the ninetieth day, after healing had been stationary for two or three weeks, an erythema-producing exposure to the front was again made and after forty-eight hours, another to the back. Within twelve to fourteen days, beginning healing was again evident in the roentgenogram and the calcium rose to normal, while the inorganic phosphate level had a tendency to fall. Again, on the fiftieth day after the exposure the calcium level dropped and the inorganic phosphate level rose, while the healing process in the roentgenogram progressed to an 80 per cent level. The calcium lever, however, did not reach the former depth and so no clinical signs of spasmophilia were observed. In the charts the black columns represent healing rickets and the percentage of progress is indicated by the height of the columns. The white columns represent stationary healing or redeveloped rickets. The sign of V at the foot of the x-ray space also indicates the absence of any active healing. The black triangles indicate the presence of the Erb phenomenon, the dotted line in the upper part of the space being at the level of 5 ma.; 5 + or 5 ↑ denotes milliamperage above 5; Chvostek O means negative; Chvostek +, one plus; Chvostek ‡, two plus, and so on.

Therefore, we were of the opinion that the combination of the factors responsible for the production of most cases of spasmophilia were:

1. Rickets.
2. Exposure of the rachitic infant to the influence of the antirachitic factor in one form or another in a sufficient degree to produce some healing.
3. Interruption of such exposure for an interval usually of from thirty to sixty days or inadequacy of the exposure, or both.

The effect of this combination is to bring about a progressive healing of the rickets, which, however, is incomplete, slow and mild. Therefore, the statement made that spasmophilia is associated with healing rickets is incorrect and misleading. Rickets, when adequately and uninterruptedly treated, in our experience heals vigorously and without the production of any spasmophilic symptoms.

THEORY OF INTERRUPTED THERAPY

In our search of the literature, we find that Huldschinsky [5] was the first to associate treatment of rickets with the development of spasmophilia. However, while in his discussion he considers two explanations for his observations one of which is inadequate therapy in the form of "Blaulicht" (Uviol glass filtered quartz lamp rays), he paradoxically drops this and chooses the other, namely, the deposition of calcium in the bones at the expense of the other tissues as the result of the beginning of antirachitic therapy.

No better material to serve as a basis for the explanation offered by us can be found than Huldschinsky's own six case reports. They represent excellent examples of our ideas of interrupted therapy or inadequate therapy in three of the six cases in which spasmophilia developed after admission to the hospital.

They also conclusively show that whenever adequate therapy ("Weisslicht," i. e., unfiltered quartz lamp rays) was used in these and the other cases, the spasmophilia quickly improved and disappeared without becoming worse, as it should have done had an increase of calcium deposition in the bones been responsible for the development of the spasmophilia, something which must have occurred with the more marked healing established as the result of the institution of the unfiltered quartz lamp therapy ("Weisslicht").

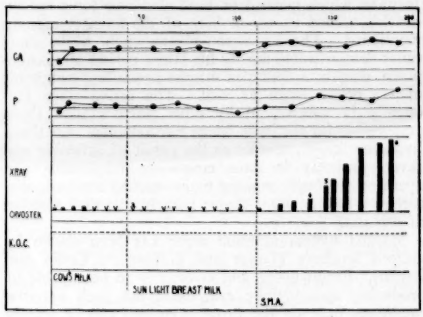

Chart 2.—Observations in the case of the second infant, W. W.

What the mechanism is that brings about the spasmophilic picture in the manner here described we are not prepared to say, although we feel that there is probably more than one change in operation as a result of the institution of interrupted or inadequate therapy.

In a previous summary communication [6] on this subject, we included the report of a case of low phosphorus rickets which was treated by a single dose of the antirachitic factor in the form of an exposure to a

5. Huldschinsky, K.: Ztschr. f. Kinderh. **26**: 207 (Sept.) 1920.
6. Gerstenberger, H. J.; Hartman, J. J.; Wilder, T. S., and Smith, D. N.: Proc. Am. Pediat. Soc. **39**: 51, 1927.

mercury quartz lamp at a distance of 80 cm. for ten minutes with the resulting production of a definite erythema. After an interval a slowly progressive healing began which was accompanied by the development of spasmophilia (calcium 6.5, cathodal opening contraction 3.5 ma., chart 1). In other words, spasmophilia developed in this infant as the result of interrupted therapy and with progressive but mild and incomplete healing. A second attempt with a single exposure was followed again by renewed and more marked healing, but without the development of the spasmophilic picture, although the calcium and inorganic phosphate tended toward spasmophilic levels.

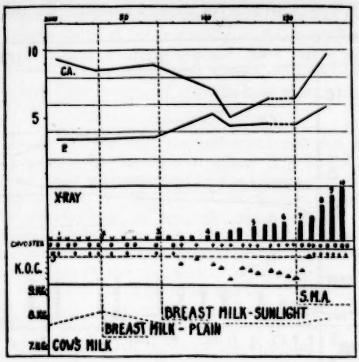

Chart 3 (E. T., colored, aged 8 months).—Development of a spasmophilic picture after the ingestion of human milk possessing some antirachitic property but not enough to cure rickets. The Erb phenomenon occurred fifty days after the beginning of feeding with breast milk-plain, and twelve days after feeding with breast milk-sunlight. A drop in the calcium and a rise in the phosphate level appeared seventy-two days after the beginning of feeding with breast milk-plain and thirty-four days after the beginning of feeding with breast milk-sunlight. The lower cathodal opening contraction level and the lowest drop in calcium appeared eighty-four days after the beginning of feeding with breast milk-plain and forty-five days after the beginning of feeding with breast milk-sunlight.

AUTHORS' EXPERIENCES WITH INTERRUPTED AND INADEQUATE THERAPY

Additional experiences of a similar nature have been obtained by us since the report [6] was made and it is to these that we direct particular attention at this time.

The first group of patients consisted of three rachitic infants who were fed human milk produced by three wetnurses who were exposed from 11 to 11:45 a. m. daily to the summer sun (face, arms and neck triangle) as a part of a study to determine the effect of exposure to sunlight, limited both in time and in area, on the antirachitic factor content of the milk produced. One of the infants was slightly spasmophilic when the milk from wetnurse S 1928 was fed to her in the hope that it would be adequately antirachitic to cure the spasmophilia. Instead, the spasmophilia continued to exist and even to get somewhat worse, while a slight and slow heading process progressed, as portrayed by the roentgenograms.

The second infant, W. W. (chart 2), had more severe rickets than was anticipated and did not show any signs of healing in the roentgenogram until the fifty-seventh day of feeding with milk produced by wetnurse K 1928. At this time no indication of improvement was present in the blood serum. It was concluded, therefore, that the development of a spasmophilia probably could not occur soon and consequently an antirachitic was administered in the form of S. M. A., with the result that healing developed and progressed without the appearance of a spasmophilia. The slowness with which healing occurred after the administration of S. M. A. indicates that the rickets in this infant was marked. This, together with the fact that the skin of this wetnurse was distinctly darker than that of the others, may be the reason why healing did not occur as early in this infant as it did in the others.

A third infant (E. T.) received milk produced by wetnurse W during 1927 and developed spasmophilia in a classic manner (positive Chvostek phenomenon, positive Erb phenomenon, cathodal opening contraction to 1.5 ma., and the characteristic fall in the calcium and rise in the inorganic phosphate level of the serum). This appearance of the spasmophilia was associated with healing, which was progressive although slow and mild as registered by the roentgenograms. The details of the observations made during the period of giving the sunlight breast milk and also before and after it can be ascertained from chart 3.

It can be concluded from the resumption of healing visible in the roentgenograms that the antirachitic factor was present in this breast milk but that quantitatively it was inadequate for complete healing such as is usually obtained by us when a rachitic infant is given 3.5 cc. of cod liver oil daily in the form of S. M. A., or when it is exposed to the quartz lamp in the ordinary fashion.

It also should be noted that the giving of the sunlight breast milk in this infant was preceded by a period of approximately thirty-six days during which the breast milk of the wetnurse was fed before her integument was regularly exposed to the sun in the fashion described. Even this breast milk had some antirachitic powers, as a slight evidence of healing was recognizable when the feeding of the sunlight breast milk was begun.

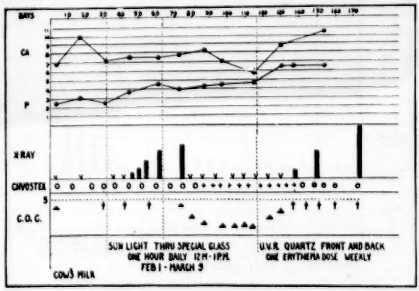

Chart 4 (A. A., white, aged 5 months).—Development of spasmophilia in a white rachitic infant who from February 1 to March 9 was exposed daily from noon till 1 p. m. on a veranda closed in with a special glass. On the fifteenth day after the first exposure, signs of healing appeared roentgenographically and continued for twenty-nine days up to a percentage of 60, when it remained stationary. On the fifty-seventh day after the first exposure—sunshine was liberal during the first few days of February—the first definite Chvostek phenomenon was observed together with a distinctly positive Erb phenomenon. On the eighty-fifth day the Erb phenomenon had become most positive and the calcium had dropped to its lowest level and the phosphorus had risen to its highest level. The chart also shows that both spasmophilic and rachitic symptoms disappeared when the infant was exposed once a week to an erythema dose of the quartz lamp.

As the wetnurse was in no way restricted in her going in and out of the hospital at that time, she probably was exposed to sunlight more than we had anticipated, and

this most likely is the reason why her milk possessed a slight antirachitic value even before regular exposures were started.

The fact that positive Chvostek and Erb phenomena were present twelve days after the beginning of the "sunlight breast milk" feeding also indicates that the "plain breast milk" possessed antirachitic qualities and was responsible for the beginning of the appearance of the spasmophilia. The spasmophilic symptoms appeared on the fiftieth day after the beginning of the feeding with the "plain breast milk," which corresponds with the period observed in J. B. (chart 1). The two methods of precipitating the spasmophilia, however, were different in that the latter patient developed spasmophilia clearly as the result of interrupted adequate therapy, whereas the former received what was more likely to be a form of more or less continuous inadequate therapy, although one can imagine that, as a result of variability in the intensity of the sunshine to which the wetnurses were exposed, the antirachitic factor content of the milk produced might be present in some specimens and absent in others, and that a kind of interrupted therapy might have been instituted in this fashion.

The speed with which S. M. A. cured the rickets in this infant—definite improvement in ten days, and healing in thirty—also demonstrates that the sunlight breast milk had antirachitic powers and had improved the rachitic state of the infant.

The second group consisted of four rachitic infants who were exposed daily (from 12 to 1 p. m.) from Feb. 1 to March 9, 1929, to sunlight transmitted through glass that is more permeable to the ultraviolet rays than is ordinary window glass. This study was carried out to ascertain the relative efficacy of the glass at that time of the year in the city of Cleveland. During the month following these exposures two of the four infants developed definite spasmophilic symptoms, the third showed only a positive Erb phenomenon, and the fourth infant was negative but probably went home too soon.

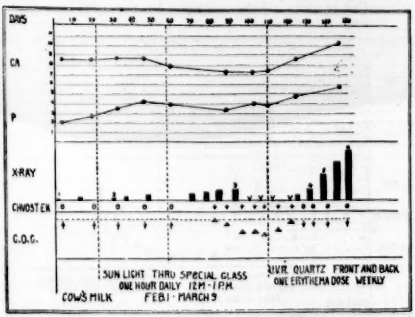

Chart 5 (F. G., colored, aged 10 months).—Development of spasmophilia under the conditions described under chart 4. Both the clinical and the blood symptoms of spasmophilia as well as the healing in the roentgenogram, while present, were not as marked as observed in patient A. A. in chart 4, even though this patient showed evidences of very slight healing on admission and during the period of exposure, which healing was evidently due to the application of the antirachitic factor before admission. The smaller result probably was due to the fact that the difference in pigmentation between the colored and the white infant was sufficient to make the same dose of sunlight of smaller antirachitic value to it than it was to the other patient. Rapid improvement in every respect followed the exposure of the infant once a week to an erythema dose of the quartz lamp.

It so happened that the first days in February during the hour chosen for the exposure were rich in sunlight, and it therefore may be that the interval required in these infants for the development of the spasmophilic picture was closer to sixty than to thirty days, although it is impossible to be positive about this, as the sun shone brightly on other days toward the end of the month. One of these infants was white and the other two were colored. All showed a positive Chvostek and

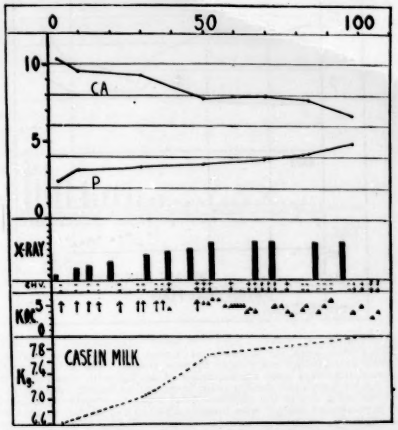

Chart 6 (H. C., colored, aged 10 months).—Course of development of the classic spasmophilic picture—low blood calcium level and high phosphate level in the blood serum, positive Erb and Chvostek phenomena, and progressive but slow and incomplete healing apparent in the roentgenogram—in a patient who on admission showed blood figures typical of ordinary infantile rickets and, what is very significant also, definite though slight roentgenographic healing. Without hospital therapy the healing increased and gradually rose to a 60 per cent level at fifty days, beyond which it did not go. At this period the clinical symptoms of spasmophilia began to appear and the blood picture became more and more classic. This patient probably was subjected to the influence of the antirachitic factor shortly before and up to admission and in a manner that was sufficient to produce and continue healing for a period of fifty days. The institution of the treatment-free period after admission evidently represented in his case an interruption in treatment, with the resultant spasmophilic development. It is safe to state that, had this infant been given the regular antirachitic therapy on admission, he would have shown rapid and complete healing without the appearance of spasmophilia. In other words, it is evident that in this infant the three factors considered by us to be basically important in the production of spasmophilia were present; namely, rickets, exposure of the rachitic infant to the influence of the antirachitic factor in one form or another in a sufficient degree to produce some healing, and interruption of the exposure or inadequacy of exposure, or both.

a positive Erb phenomenon. The symptoms in the white infant, however, were more definite. The roentgenograms of this white infant likewise showed more healing than did those of the colored infants. Chart 4 (A. A.) gives the details of the observations made in this infant, and chart 5 (F. G.) presents the record of one of the colored infants.

Since at the same time there were in the hospital other infants with rickets who were being exposed to the antirachitic factor in various forms and in an adequate manner, as proved by the rapidity with which healing was apparent in the roentgenogram and in the blood serum, without developing symptoms of spasmophilia, we feel justified in concluding that the factors of inadequate therapy or interruption of therapy, or both, were responsible for the development of the spasmophilic picture in these three rachitic infants, and that this observation corroborates and substantiates our

previous conclusion; namely, that spasmophilia is likely to develop if the triple combination referred to is established.

DETAILED OBSERVATIONS IN TWO INFANTS

For the sake of clarity and completeness, we are including in this presentation four charts illustrating the observations which have been made by us in quite a number of other infants and which have led to the conclusions stated at the beginning of this contribution.

Charts 8 and 9 are additional good examples of interrupted therapy which was carried out unintentionally before these studies of spasmophilia were begun.

COMMENT

It is our opinion that the additional evidence herewith presented in the form of charts 3, 4 and 5 represents a valid substantiation of the ideas advanced by us regarding the etiologic rôle of the three basic factors in the development of infantile spasmophilia. Our explanation makes clear why both rickets and spasmophilia can be cured and prevented by the adequate administration of the antirachitic factor and why some cases of rickets present spasmophilic symptoms and others do not. Also, we are convinced that our interpretation is the only one that satisfactorily explains both the spring and the fall peaks of spasmophilia.

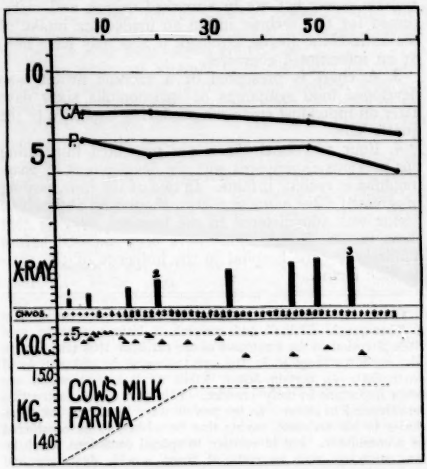

Chart 7 (W. T., colored, aged 3¼ years).—Typical blood and clinical picture of spasmophilia with mild progressive healing, which continued to increase for fifty-five days to a maximum of 70 per cent. During this period the calcium remained low and had a tendency to go lower, whereas the phosphorus rather continued to remain high. Both the Chvostek and the Erb phenomenon gradually became more severe. This chart will be better understood and appreciated when it is studied in the light of the data presented in chart 6, as one then can accept that before admission to the hospital the patient went through a stage similar to the one observed in the hospital for H. C., chart 6. Chart 7 might well be directly attached to chart 6 and in this manner complete the picture of the typical development of spasmophilia in its classic form.

Moro, particularly, has been interested in finding the solution for the spring and fall peaks of spasmophilia. He states that the disappearance of spasmophilia during the summer is without question principally due to the presence of adequate sunshine resulting in the curing of rickets. He then proceeds to conclude that domestication is principally responsible for the production of spasmophilia, as it causes the development of a rickets that "has a tendency to be associated with latent tetany and hypocalcemia." However, he argues further that this cannot be the sole cause and suggests that the additional factor is an increased excitability and irritability of the vegetative nervous system. He associates this irritability with the biologic spring [7] and has

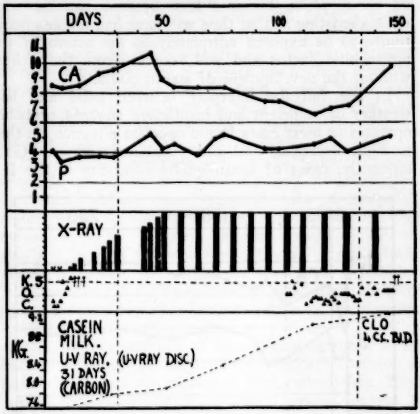

Chart 8 (M. M., colored, aged 13 months).—Development of spasmophilia seventy days after carbon arc therapy had been interrupted (drop in calcium level, high inorganic phosphate level, cathodal opening contraction as low as 1.5 ma.). When the patient was admitted, she presented a clinical picture of spasmophilia. The instituted therapy, which continued for thirty-one days, cured this and also produced complete healing, as evidenced roentgenographically fifty days after the beginning of the therapy. This patient evidently had redeveloped before the admission to the hospital a second rickets, the first having been treated in some fashion, as spasmophilic symptoms were present on admission. The rapidly beneficial effect of 4 cc. of cod liver oil twice daily is likewise apparent. This is an illustration of interrupted therapy.

coined in this connection the term "Hormonale Frühjahrskrise." [8] In order, however, to explain the irregular eruptions of tetany he finally adds to these two factors the sudden appearance of a strong south wind, "Foehn," especially following prolonged freezing weather.

Moro's explanation, however, cannot be used to explain the appearance of spasmophilia during the fall, whereas the interpretation offered by us can explain tetany equally well whether it appears in the spring, in the fall or, as it occasionally does, during the summer.

As is well known, rickets in our part of the world develops principally during the winter months because of the relative absence of sunlight and because, owing to cold and inclement weather, we cover our bodies more heavily during this period of the year. When at the end of winter and in the beginning of spring better weather appears, human beings, including infants, are glad to get out into the open and, as a result, unknowingly are exposed to the action of the antirachitic factor. This exposure may be repeated for a number of consecutive days or weeks and may be sufficient to cure rickets without the development of spasmophilia. Usually, however, it happens that the first periods of good weather are followed by more or less prolonged

7. Moro, E.: Klin. Wchnschr. **5**: 925 (May 21) 1926.
8. Moro, Stepp and György: Avitaminosen, p. 350.

and irregular periods of cold and cloudy weather which forces a return to indoor life and winter clothes. This change represents, in our opinion, the automatic interruption in the exposure of the skin of the rachitic individual to sunlight and, when it persists long enough, results in the development of the spring spasmophilic picture, if the earlier exposure to sunlight has been of sufficient degree to start the healing process. When good weather is continuously at hand, the incidence of spasmophilia becomes less, because patients with rickets existing at that time will have had ample opportunity to be exposed adequately to the action of the antirachitic factor and will recover from the rickets without the development of spasmophilia.

In the fall the interplay between good and bad weather or sufficient and insufficient sunlight probably operates in most cases in the opposite direction, in that sunlight decreases and bad weather increases. Consequently, cases of spasmophilia occurring in the fall

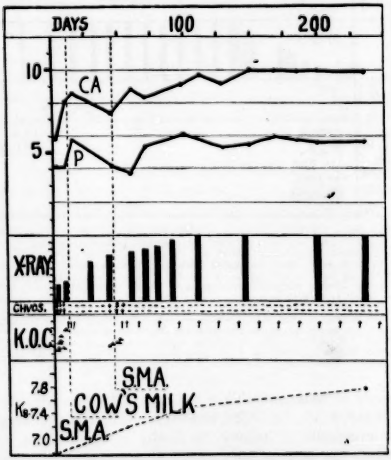

Chart 9 (M. C., colored, aged 11 months).—Development of spasmophilia thirty-three days after feeding with S. M. A. had been interrupted after ten days by being replaced with cow's milk. Healing progressed during this period and continued to the complete stage, when feeding with S. M. A. was again instituted. The symptoms of spasmophilia rapidly disappeared after the second feeding with S. M. A. On admission, the patient showed symptoms of spasmophilia and slight progressive healing in the roentgenogram. The ten days' feeding with S. M. A. at this time was adequate to remove spasmophilic symptoms. This is an illustration of interrupted therapy.

are seen principally in young growing infants, who because of their tender age have been protected against exposure to the summer sunlight and who as a result have developed a mild rickets, and who then are exposed to sunlight during the late summer or early fall only to have the exposure interrupted or decreased by the oncoming colder weather, with a consequent development of the fall and early winter peak of spasmophilia. Naturally, cases of severe rickets are less common following summer than winter, and this fact probably also is concerned in making the fall spasmophilia peak smaller than the spring peak.

During the summer, artificial rather than natural conditions are responsible for the cases of rickets and spasmophilia encountered during this season, but the factors responsible for its production are the same.

CONCLUSIONS

1. Additional evidence has been presented as a valid substantiation of the theory advanced by us on a previous occasion regarding the etiology of infantile spasmophilia; namely, that three factors are essential to its development: (*a*) rickets; (*b*) exposure of the rachitic infant to the influence of the antirachitic factor in one form or another in a sufficient degree to produce some healing, and (*c*) interruption of the exposure or inadequacy of the exposure.

2. The evidence presented consists of a report of the development of typical spasmophilia due to interrupted therapy in two rachitic infants who were exposed to sunlight and due to inadequate therapy in one rachitic infant who received human milk possessing some antirachitic powers.

The two infants were exposed daily at noon for one hour to sunlight as it passed through glass that was more permeable to its ultraviolet rays than is ordinary window glass. Approximately sixty days after February 1, or twenty-four days after March 9, the first symptoms of spasmophilia appeared. The most marked spasmophilic symptoms were observed from eighty to ninety days after the first of February.

The other infant developed spasmophilia after and while being fed milk from a wetnurse whose skin (arms, face, chest triangle) was exposed daily to the summer sun for forty-five minutes. This milk had antirachitic power but not in a marked degree, and represented for this rachitic infant an inadequate intake of the antirachitic factor, although it also may have been of an interrupted character.

3. A chart is presented of a rachitic infant who developed mild symptoms of spasmophilia sixty days after an individual erythema-producing exposure to the quartz lamp.

4. Four additional charts are presented illustrating our previous experiences with the development of spasmophilia in rachitic infants. In two of the four, healing progressed after admission even though no antirachitic factor was administered in the hospital, proving that these rachitic infants must have been exposed before admission to the hospital to the influence of the antirachitic factor.

Osler on Treatment.—There were those who called him a "therapeutic nihilist" and complained bitterly that he paid little attention to the treatment of the patient. It is true that in his ward teaching, as in the private ward, he did not dwell particularly on certain lesser details of treatment which are often important in daily practice. This part of the instruction he delegated to others. In the private ward he always left these duties to his assistant, saying that he wished to be considered as a consultant. But in relation to special conditions which he was studying, such as malarial fever, amebic dysentery and typhoid fever, he went into the treatment with care. If, however, he did not in his teaching give time to the discussion of the details of medication, to the character or the color or the taste of the menstruum in which the drug might be administered, he did, through his daily intercourse with patients, public or private, teach us how to conduct ourselves with the patient and how to practice medicine. This was quite in character with the conduct of his life. He taught by example, not by precept. He taught us very quickly that medicine could not be practiced and that disease could not be treated by rule or rote. He taught us that the treatment of the patient was the most important element in the treatment of disease, that the patient, not the disease, was the entity. He taught his students to use their minds and stand on their own feet. He taught us not to give medicine unless we had a real reason for it.—Thayer, W. S.: Reminiscences of Osler in the Early Baltimore Days, *California & West. Med.*, September, 1929.

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FOOD FACTORS OTHER THAN VITAMIN D IN RICKETS*

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Not all the factors concerned in the etiology of rickets are known. The most that there is justification for asserting is that certain agents are known which, when used, exercise a beneficial effect in arresting the pathologic processes and restoring the injured tissues to a condition that approximates normal.

The vitamins have been studied with much more thoroughness than have the mineral elements. There is fairly definite knowledge of a few of the mineral salts such as calcium and phosphorus, but knowledge of the functions of such elements as silicon and fluorine, which appear to be necessary in the growth of bones and teeth, is most elementary.

Little is known of the relation between the vitamins and the mineral elements of the food, but in this connection it is interesting to note that the diet of Eskimos who are relatively free from rickets consists largely of raw liver and the glands and oils of mammals and of cod fish. These not only contain a high vitamin D content but are also rich in iodine, iron, manganese and traces of copper and zinc.

The relation between the mineral elements and the enzymes is interesting. Marine and others have found that when rabbits are fed a diet of boiled cabbage they soon develop goiter, but when fed the same cabbage in its raw state they remain goiter free.

The addition of vitamin C in the form of orange juice or lemon juice to the boiled cabbage does not lessen the goitrous influence, but when the juice of the uncooked cabbage is added to the boiled cabbage the rabbits do not become goitrous.

It has been repeatedly observed that premature infants and twins are peculiarly susceptible to rickets. This sometimes occurs when the mother has taken cod liver oil and a diet that appeared satisfactory. Hess and Weinstock,[1] in their summary, write:

> It has been taken for granted that variation in predisposition to rickets is due largely to variability in the store of the antirachitic factor which infants bring with them into the world, the store being magazined in the liver. In order to subject this hypothesis to the test of experiment, we carried out a biologic assay of the livers of a series of infants. As it is well established that premature infants have the greatest disposition to rickets—in fact, few of them are spared even when nursed and given cod liver oil early in life—one would expect a definite lack of the antirachitic factor in this group as compared with infants born at full term. A comparison of this kind should serve to bring into sharp relief the assumed prenatal "vitamin" deficiency of the susceptible infant.
>
> Our study showed, on the contrary, that the livers of premature infants contain as much of the antirachitic factor as those of infants born at term. In view of this result it would seem that, in general, individual predisposition to this disorder does not depend on prenatal hoarding of this "vitamin" but on other factors. Differences in the percentage of ash in the skeleton at birth and in the rate of growth in the early months of postnatal life undoubtedly are of importance, but in all probability deeper biologic influences, of which we have no knowledge, also play a rôle.

It has been believed for some time that the so-called deeper biologic influences may be concerned in the etiology of rickets, but this cannot be determined until our knowledge of the various food factors has been greatly increased.

Iron, manganese, cobalt, copper, nickel and zinc have been thought to be factors in the etiology of rickets. It is known that iron and possibly manganese, copper and cobalt are stored in the liver of the fetus during the latter months of pregnancy. Anemia in premature infants and in twins is not unusual, and the hemoglobin is invariably low in rickets. From reports received from the University of Tennessee, I have come to believe that these elements are vitally concerned in the unusual strength of new-born colts, calves and other animals born and reared in regions where these elements are relatively abundant in the food supply. It is said that in such regions both the muscular and the bone development in young animals is superior to that of other regions.

The so-called adequate diet in the light of recent research may or may not mean anything. Two samples of spinach, or any other vegetable, may on analysis[2] result in a very different chemical formula. The various important elements may be present, absent or available in such diminished quantity as to make them relatively useless in samples of the same vegetable.[3] The presence and the proportion of these elements seem to be determined by such factors as the soil, fertilization, relative sunshine and precipitation.

The proteins and fats of animal origin appear to be important factors in the etiology of rickets because it has been repeatedly observed that, where the food supply is preponderantly of animal origin, rickets is rare or nonexistent. Mellanby states that rickets is unknown in the west of Ireland. He says:[4]

> It is a well known and significant fact that the land in the west of Ireland is unsuitable for profitable agriculture and that the raising of cattle and sheep upon a rather large scale constitutes the chief occupation of the inhabitants. Meat constitutes the greater proportion of the diet of the people.

McCollum[5] asserts that whenever meat and dairy products constitute the larger proportion of the diet, the physical development of the people is excellent; but when agriculture thrives in growing cereal grains and tubers as the most profitable form of produce, physical deterioration as shown by stunted growth, physical inferiority and defective and carious teeth is likely to characterize the people of both the rural districts and the cities.

In considering the proteins, a deficiency of which may prove to be an important etiologic factor in rickets, it must be remembered that their value is determined by the numbers and varieties of amino-acids present; consequently, they must be selected from both animal and vegetable sources.[6] These amino-acids must include tryptophan and lysine, as it has been proved that they are both important and influential factors in growth and development, with which rickets is invariably associated.

In this connection it is well to remember that attention has been called by Hess and others to the fact that rickets occurs more frequently among fat babies than in those who are lean. It is not from the protein element of food that fat is primarily derived.

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*Read before the Section on Diseases of Children at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 1-5, 1929.

1. Hess, A. F., and Weinstock, Mildred: An Investigation of the Prenatal Factor in the Susceptibility of Infants to Rickets.
2. Analyses from South Carolina Research Laboratory.
3. Reports from the Experiment Station, University of Utah.
4. Mellanby, E., in McCollum and Simmonds: The Newer Knowledge of Nutrition.
5. McCollum, E. V., and Simmonds, Nina: The Newer Knowledge of Nutrition, ed. 3, New York, Macmillan Company, 1925.
6. Sherman, H. C.: Chemistry of Food, ed. 3, New York, Macmillan Company, 1926.

Writers on the subject of rickets have laid a great deal of emphasis on the presence of a proportionately large amount of the diet derived from cereal grains. The observations of Burton, as published in his book "A Summer in Iceland," reveal the effects of the introduction of highly milled cereals into the diets of the Icelanders with the result that the adult inhabitants developed dental caries and the infants rickets. Both were unknown before such cereals became a regular article of diet. It is a question whether highly milled cereal grains are not more of a poison than a food, because in their milling the cortical and germ portions of the grains are removed and it is in these portions that the vitamins, mineral elements and the most important of the amino-acids are found. It is my experience that neither growth nor development takes place in infants when cereals of the highly milled variety are used, but when the whole grains, however finely crushed they may be, are fed, they distinctly improve appetite and stimulate growth. Analyses show that the cereal grains are subject to the same influences in the determination of their mineral and vitamin value as are vegetables. Particularly is this true as to phosphorus. When wheat is grown in the blue grass region of Tennessee or Kentucky, it contains approximately three times as much phosphorus as when grown in Minnesota, Wisconsin or Michigan. The amount of cobalt present in cereals and vegetables is variable in different sections and soils. It appears to be relatively abundant in certain limestone sections. In these sections live stock attain unusually fine size and development.

I have no direct information as to what if any influence iodine deficiency during prenatal life exercises on the subsequent occurrence of rickets in the infant. From information received from observers [7] resident in the goiter area of the United States, I draw the conclusion that, when the mother has a goiter, the offspring often develops manifestations of either osteoporosis or rickets. Further inquiry elicits the information that in Austria, in the district of Salzburg, which has been a noted goiter focus since Paracelsus described it in 1616, both osteoporosis and rickets are of as frequent occurrence as is goiter in later childhood.

The importance of breast feeding as an etiologic factor depends, I believe, entirely on the diet of the mother during gestation and lactation. While hygiene and sunshine are important influential factors, they do not appear to exercise a determining influence.

Mellanby [4] has described the living conditions on the island of Lewis. He says that the inhabitants live under the worst hygienic conditions imaginable; that many of the houses have a filthy byre in one end of the building, and that most of the houses do not contain a window. A peat fire is kept constantly burning, the smoke of which can escape only through the thatched roof or through the open door. The babies are taken outdoors only in bright weather, which is not often; but, he says, regardless of these unhygienic conditions the children remain comparatively free from rickets. The babies are invariably breast fed and the mothers' diet consists of cod heads stuffed with cod livers, milk, fish, turnip, oatmeal and potatoes. The chief element of the diet is of animal origin.

It is a matter of common observation among those who are familiar with the plantation life of the negroes in the southern section of the United States that they spend most of their time outdoors, both young and old, and that they wear few clothes, the babies and children often none. Yet rickets is common among the infants, although they are breast fed. The mothers' diet consists mostly of corn bread, white flour bread, a gruel from corn meal, bacon, and vegetables boiled with bacon.

I am not convinced that the teaching of Heubner and Czerny that rickets is a general metabolic disorder which affects the body as a whole but which manifests its principal activity in the osseous system is far from wrong.

It has not been proved that the abnormal relationship of calcium and phosphorus in the blood serum of rachitic infants, as reported by Howland, Park, A. F. Hess and others, is other than an effect of a dietary deficiency. That solar irradiation or irradiation by the mercury vapor quartz lamp results in restoring a normal relationship and a deposition of these elements does not prove that they were the sole causes of the interrupted relationship, because unless a radical change is made in the diet by the addition of articles of food that so far as is known supply all the elements of diet that are believed necessary for the ordinary nutritional requirements, the effect will be temporary.

As a result of the work of Howland, Park, Cramer, Czerny, Mellanby, György, Findlay, A. F. Hess and others, it must be concluded that irradiation is the most important factor that has been presented up to this time in the treatment of rickets.

Freudenberg, McClure and Chancellor, König, Lenant and others have called attention to the carbohydrate disturbance present in rickets. These authors have demonstrated that in rachitic infants there occurs an increased amount of diastase in the urine and in the feces and a decrease of the glycolytic power and the lactic acid level of the blood serum and perhaps a defect in blood sugar level regulation. It is likely that these are secondary effects.

Theories have been advanced from time to time to the effect that the glands of internal secretion might be responsible for rickets. Bosanyi considered hyperfunction of the bone marrow as the primary stage in rickets. Others have maintained that the vegetative nervous system was primarily involved, and still others that the enzymes were at fault.

Findlay considered that a lack of exercise was responsible for the production of rickets. None of these theories are seriously considered at this time.

Whatever may be the cause or causes, the fault seems to be situated in the diet and results in a failure of phosphorus deposition and calcification of the bones that tend to grow most rapidly.

7. Personal communication to the author.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. GERSTENBERGER, HARTMAN, RUSSELL AND WILDER AND DR. WESTON

DR. C. ULYSSES MOORE, Portland, Ore.: A hospital like that of Dr. Gerstenberger and his associates which makes galvanic tests and blood calcium and blood phosphorus determinations in every patient certainly sets a high standard of scientific service. Their method of differentiating between spasmophilia and rickets and of showing the relationship between the two is a distinct contribution to the study of these dyscrasias. They have shown us again the importance of clothing or rather a lack of it. Dr. Weston's paper recalls the importance of adequate amounts of minerals properly proportioned. It is refreshing to know that when most of us are confining our research to vitamins, he is testing the inorganic elements. In 1920, Dr. Olson of Washington State College presented a paper before the Portland Academy of Medicine in

which he stated that all the work on vitamins would have to be done over since changes in the mineral ions used could produce many of the conditions supposedly due to vitamins. Recently it has been shown that copper is as necessary as calcium in the human body. Formerly its presence was considered useless if not actually injurious. Now Dr. Weston encourages us to recommend more strongly than ever the use of the natural cereal products because the whole grain cereals contain most of the minerals needed by our bodies. We certainly need to thank him for his encouragement, especially when there is so much propaganda going out from the mills that make white flour and refined cereals.

DR. F. TOM MITCHELL, Memphis, Tenn.: It has been a long time since food deficiencies have been thought or proved to be the cause of rickets and of kindred ailments. I think probably twenty-three years ago Hopkins first decided that rickets was a diet deficiency disease. A few years after that vitamin A was separated, and now, twenty-five years after the beginning of this line of thought, one is able to see produced in the laboratory this valuable substance. Vitamins, to me, have always been a sort of questionable substance that one could not put one's finger on, and one was not absolutely positive as to which and what symptoms they would relieve. I have had only recently two cases of active rickets which, with the use of cod liver oil, ergosterol, diet, and irradiation with the ultraviolet lamp and sunshine, did not respond completely. Active rickets was still evident. Those cases give me the idea that perhaps some other deficiency which we do not yet recognize and which may be suggested by Dr. Weston's article is active. It may even be possible that as our knowledge of these mineral matters in the diet develops, we may find that certain minerals have a special action on the parathyroid or on some other gland which according to some has to do with the causation of rickets. We have known for a long time that a hypocalcemia in rickets is the cause of the symptoms that we recognize as either latent or active tetany. We are indebted to Dr. Gerstenberger and his co-workers for the elaboration of the detailed reason that spasmophilia should develop at a certain definite, specified time.

DR. HARRY STEENBOCK, Madison, Wis.: Some experiments have been made to determine whether irradiation of the human being would affect the antirachitic potency of the milk. In general, the claims have been that it did, but I do not consider any of the experiments that have been made as being conclusive. Furthermore, attempts to increase the antirachitic potency of human milk by the administration of cod liver oil have not been as clean cut as they should have been. The symptoms of hypervitaminosis are not very definite in character. Originally, I was of the opinion that the symptoms were due to a toxic effect of other substances than vitamin D itself. In the conversion of ergosterol to Vitamin D, no more than 10 per cent is changed to vitamin D. The rest of the ergosterol is used up in side reactions, resulting in the production of a host of other substances. Unfortunately, we do not know anything about the structure of ergosterol other than that it has three unsaturated bands or groupings. In fact, some chemists say there are only two, and that one is generated in the course of treatment in the various ways that are used to determine whether or not these exist. We know that ergosterol has an OH group, and is an alcohol, but we are absolutely not in a position to study the changes that take place in the course of the transformation of ergosterol into vitamin D. There was a possibility that the other substances formed in the course of irradiation might bring about this toxicity. But the very fact that there is this increased deposition of calcium and phosphorus in the various tissues of the body, with an excessive administration of vitamin D, would speak against such a factor as being the cause of the toxic reactions. The primary symptom of hypervitaminosis is anorexia. An animal within twenty-four hours refuses to eat. Then it is inactive. Sometimes its respiration is labored, and in those cases we have found the accumulation of considerable exudate in the pleural cavity. We have obtained as much as 1 cc. of fluid from the pleural cavity of a 60 Gm. rat, which was excessive. We have found engorgement of the pulmonary-vascular system, sometimes leading to congestion of the lungs. Again, that has not occurred, and the lungs have been in perfectly normal condition at the time of death. The thing I want to emphasize is that there is no absolute vitamin D requirement. The requirement varies to the extent of these other factors, the lack of balance between calcium and phosphorus, the antagonistic substances, rapidity of growth of the individual, and so on, to the extent that all such factors are operative. Therefore, the dosage of vitamin D cannot be set at a definite figure. That is where the judgment of the practitioner comes in, and, of course, there is the necessity of being sure that the individual gets enough. We believe that with the precautions that are being used in preparing this compound there will be no danger of hypervitaminosis.

DR. WILLIAM WESTON, Columbia, S. C.: I do not know what makes vitamin D so effective under certain conditions and not under others. I do not deny the effectiveness of vitamin D, but there are certain conditions, which we can demonstrate, in which it is not as effective as under ordinary conditions in the white race.

DR. HENRY J. GERSTENBERGER, Cleveland: There is no question of the truth in what Dr. Weston says when he maintains that many factors might play a rôle in the development of rickets. We must remember, however, that in human infants it is primarily the antirachitic factor that is responsible for rickets by its absolute or relative absence. Why? Because practically every human infant gets either human milk or cow's milk, and when he gets either of these two foods he is receiving all of the minerals and all of the other substances that he needs for normal growth, except the antirachitic factor. Therefore, in the last analysis, human rickets must be due to an inadequate exposure of the infant's skin, or of its nursing mother's skin, to sunlight, or to an inadequate intake, as a substitute for nature's antirachitic rays, of an antirachitic substance into the gastro-intestinal tract. This material practically is either cod liver oil or viosterol. I was afraid that somebody might think that Dr. Weston believed that human rickets is not due to the effect of the absence of sunlight or its substitute, and I am of the opinion that that is not his view.

OTITIS MEDIA AND DISEASE OF THE MASTOID

EARLY INVOLVEMENT OF THE BLOOD STREAM *

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Ballance has said: "Want of agreement among serious workers about a grave question of surgical treatment arises from the lumping together of clinical conditions having an essentially different pathologic basis, or from essential pathologic conditions not being clearly understood. . . . All true and lasting surgical practice is based on pathology and when once pathology of an affection is clearly understood, divergence of view as to its treatment ought to disappear."

In 1927, I[1] stated that a certain group of cases of early involvement of the blood stream from otitis media and disease of the mastoid could be treated satisfactorily by removal of the disease process without interfering with the sigmoid sinus or jugular vein. Further experience with such cases has more strongly convinced me of the practicability and rationality of this conservative type of treatment. Dixon,[2] in 1925, expressed a somewhat similar opinion. The rationale of the more conservative management for this type of disease is pointed out by Kerrison and Kopetsky.

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* From the Section on Otolaryngology and Rhinology, the Mayo Clinic.
* Read before the Section on Laryngology, Otology and Rhinology at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 12, 1929.

1. Lillie, H. I.: Recent Clinical Observations on Involvement of the Blood Stream in Otitic Disease, Warthin Ann. Vol., 1927, pp. 613-623.

2. Dixon, O. J.: A Departure in the Management of Infections of the Sigmoid Sinus, Arch. Otolaryng. **2**: 453-457 (Nov.) 1925.

CLINICAL PATHOLOGIC CONSIDERATIONS

In order to recognize early involvement in the blood stream in otitis media, it is necessary to observe patients carefully from the onset of the disease. The involvement may occur early in the disease; in fact, before any natural barrier can be established. In such cases the infection is usually overwhelming and all surgical efforts become quite futile. If, however, the clinical course has been quite usual, or at least not unusual, and then signs and symptoms of infection of the blood stream suddenly appear, even without signs of surgical mastoiditis, the more conservative surgical procedures will eliminate the disease satisfactorily.

It is assumed, however, that all other causes for such a sudden change in the clinical course have been eliminated. Tonsillitis, cervical adenitis, pneumonia, pyelitis, and so forth, must be considered. Bronchopneumonia in this stage may offer the greatest difficulty in the differential diagnosis. If the patient has not been under personal observation, a carefully taken history is essential.

In general, it may be said that infection or the products of infection of suppurative disease of the temporal bone may extend to the venous sinuses by one of several methods: (1) direct absorption of the infection through the small vessels in the diseased mastoid, sometimes without visible changes in the appearance of the sinus wall; (2) development of phlebitis of the sinus, without parasinous abscess, by continuity from the infected bone of the sinus groove; (3) direct extension into the sinus because of breaking down of the wall of the sinus by a parasinous abscess; (4) breaking down of the intima of the sinus by the disease process and onset of mural thrombosis, or (5) septic breaking down of obliterating thrombosis within the sinus.

It is obvious that in the early stages of involvement of the blood stream the infection will take place by the first two means. The hemorrhagic type of disease in a small-cell or diploic type of mastoid may be expected. The confluent type of mastoiditis usually sets up a natural barrier in the early stages. The confluent suppurative type of disease is generally looked on as the dangerous type by observers not thoroughly familiar with pathologic processes in the mastoid, but the hemorrhagic disease is much more serious.

It has been observed from time to time that a sudden rise in temperature in cases in which the sinus had been exposed might follow the removal of the packing from the mastoid wound. In certain cases in which the first postoperative dressing was unduly delayed, a sudden high rise in temperature would be relieved by dressing and flushing the wound. In both instances, the convalescence was without incident if the wound was packed lightly. If the symptoms of involvement of the sinus were present before operation but a visible change of the sinus could not be made out at the time of operation, noninterference with the sinus after complete operation on the mastoid was followed by an uneventful convalescence.

Cases of Otitis Media and Disease of the Mastoid Observed During 1928

Case	Age	Sex*	History and Clinical Data	Diagnosis	Operation	Sinus Surface	Comment
3	4	♂	2/7/28: Otitis media, suppurative, acute, bilateral 2/20/28: Fever in afternoon, each day; cervical adenitis; patient very ill; roentgenograms of mastoids negative; septic type of temperature; hospitalized; blood culture negative	Diploic mastoid and hemorrhagic disease	Complete mastoid operation; extensive exposure of wall of sinus; sinus plate normal in appearance	2/27/28: Left side; many small bleeding points on sinus; 2/29/28: Extensive exposure of right side; definite phlebitis of upper turn	Operation of left side did not affect course of disease; right ear normal in appearance but explored because of satisfactory appearance of left ear at time of operation
4	14	♀	2/14/28: Otitis media, suppurative, with mastoiditis, serous meningitis and phlebitis of two weeks' duration; patient looked ill; blood culture showed hemolytic streptococci; spinal fluid normal; Tobey-Ayre test negative	Diploic mastoid and hemorrhagic disease	Complete mastoid operation; extensive exposure of wall of sinus; sinus plate normal in appearance	Definite raised area of phlebitis at knee	Septic temperature on day following operation; then all right until the eighth day when suppurative otitis media developed in opposite ear
5	21	♀	3/26/28: Otitis media, suppurative, acute 4/1/28: Mastoiditis; septic type of temperature; blood culture negative	Diploic mastoid and hemorrhagic disease	Complete mastoid operation; extensive exposure of wall of sinus; sinus plate normal in appearance	Entire length reddened; small areas of weeping granulations	Only incident in convalescence was that parotitis developed on eighteenth day after operation
6	7	♂	4/9/28: Otitis media, suppurative, acute; cervical adenitis 4/25/28: Sudden chill and fever; mastoid tenderness; septic type of temperature; blood culture showed hemolytic streptococci	Diploic mastoid and hemorrhagic disease	Complete mastoid operation; extensive exposure of wall of sinus; sinus plate normal in appearance	At upper turn slightly raised reddened area covered by thin moisture; definitely circumscribed	Convalescence without incident
7	3	♂	8/1/28: Otitis media, suppurative, acute (at home) 8/20/28: Subperiosteal abscess; septic temperature; appeared very ill; blood culture negative	Diploic mastoid and confluent disease	Complete mastoid operation; extensive exposure of wall of sinus; sinus plate normal in appearance	Small petechial bleeding points of entire length of sigmoid sinus; general redness	Convalescence without incident

* In this column, ♂ indicates male and ♀ female.

It was felt in each case that absorption must have taken place directly through the vasa vasorum and that removal of the cause prevented further involvement and injury.

In confluent disease in which the sinus had been exposed, the natural barrier prevented the direct absorption. In fact, the presence of visible changes of the sinus surface did not furnish proof that the entire thickness of the wall of the vessel was involved.

It was assumed, then, that in certain of the early cases, even those in which septicemia could be demonstrated by blood culture, the disease could be controlled by a complete mastoid operation and thorough exposure of the sigmoid sinus to eliminate the earliest stage of phlebitis from contact with the diseased bone. The sinus plate may appear quite normal but its removal may reveal early visible changes in the wall of the sinus. The tendency of the sinus to force itself into the smoothed edges of bone was not interfered with and the wound was packed lightly with petrolatum gauze so as not to interfere with the formation of the natural barrier.

In these cases of early involvement of the blood stream, the advantage of such a procedure over that of

ablation of the sinus and section of the internal jugular vein is obvious, especially in cases of bilateral otitis media and mastoiditis.

CLINICAL MATERIAL

In 1927, four cases of otitis media and mastoiditis, with early involvement of the blood stream, treated by conservative surgical procedures were reported. A fifth case of rather unusual clinical interest was included to show that if further surgical intervention became necessary the patient was subjected to little added risk by deferring ablation of the sinus and section of the internal jugular vein. Since that time, five other cases have been observed under the same clinical circumstances. The results have been satisfactory, as shown in the accompanying table.

ILLUSTRATIVE CASES

CASE 1.—A man, aged 27, presented himself at the clinic, Oct. 8, 1925, complaining of stuffiness in the right ear following a cold in the head. Examination disclosed slight injection along the handle of the malleus on the right drum. In the course of forty-eight hours, definite suppurative otitis media developed for which myringotomy was performed. Convalescence was uneventful and in ten days the ear had ceased discharging and the wound in the drum had closed. Three weeks later the patient returned, complaining of the same symptoms, and the drum was found to be injected and full. Myringotomy again relieved the symptoms. After another week the patient complained of pain at night; this could not be accounted for except on the assumption that the infection had extended to the sinus or dura.

The result of the general examination was negative, including blood counts and blood cultures. There was no fever. The patient was sent to the hospital for observation, and the following day the temperature rose to 101 F. The blood culture was repeated, and pneumococcus type III was found. The leukocytes numbered 8,500. The general physical condition appeared satisfactory, but because of the positive blood culture it was decided to give a blood transfusion by the citrate method in which 80 cc. of 0.25 per cent solution of gentian violet was added to 500 cc. of the blood because the dye was thought to be specific for this organism.

Transfusion was performed on the third day after the patient's entrance to the hospital and was followed by an immediate drop in temperature to normal. A mastoid operation was performed on the seventh day and the mastoid disease was found to be of a hemorrhagic type. Many cells were filled with a thin secretion and a few granulations. The sigmoid groove was not diseased but was purposely removed. The outside wall of the sinus was studded with petechial hemorrhages with some exudate over the surface. Further exploration was made until more normal dura was encountered, but the sinus was not interfered with. Convalescence was uneventful.

In any case of this type, it would not be possible to make an earlier diagnosis as symptoms were not present to cause one to suspect extension of the infection. Blood transfusion and gentian violet seemed to control the fever but did not affect the pain at night; the operative data were sufficient to account for this and the septicemia. The patient did not appear very ill at any time. If he had not been kept under close observation, the early involvement of the blood stream might not have been recognized. None of the signs of surgical mastoiditis were present; that is, the posterosuperior angle did not sag, the mastoid was not tender and there was very little discharge from the middle ear.

CASE 2.—A boy, aged 13, was brought for examination on May 18, 1926, with a complaint of a sensation of fulness in the right ear and a discharge of two weeks' duration. Chills and fever had occurred during the previous two days. The boy looked very ill and had a fever of 104 F. The leukocytes numbered 10,400. The differential blood count showed 79 per cent neutrophils. The general examination was negative. On blood culture, hemolytic streptococci of a virulent type were obtained.

May 19, the left mastoid was operated on. The mastoid was of the small-cell type. Pus was not found in any of the cells but there was a little granulation tissue in the cells around the tympanic antrum. The wall of the sinus was purposely exposed above the knee and was found to be normal. Further exploration down toward the lower turn revealed a definite area of phlebitis which extended to the emissary vein. The wall of the sinus was changed in character and color, covered with exudate and studded with petechial spots. Apparently, mural thrombosis had not taken place; therefore, the dura was exposed to the point where it seemed to be normal but the sinus was not interfered with further.

The patient's general condition improved immediately, but after three days there was a rise in temperature to 104 F., at which time the wound was dressed and flushed. Following this, convalescence was uneventful and the patient was dismissed the ninth day after operation.

That a serious complication had resulted was obvious at the first examination because the patient seemed very ill. At operation everything was in readiness to tie the vein and ablate the sinus if it seemed necessary. When the type of pathologic change was recognized at operation the more radical operation was deferred. The intentional exposure of the wall of the sinus, with negative observations, led to further search for the disease, as it was felt that sufficient cause for the clinical picture would be found somewhere. This is an important obligation and responsibility in the surgical management of mastoid disease.

CASE 3.—A boy, aged 4 years, was referred to the clinic by his physician because convalescence following acute respiratory infection and otitis media had not been satisfactory. The child had been sick for two weeks. Pain in the ear and mastoid was not complained of but the mother had noticed that the child felt quite well in the morning hours but was flushed, languid and not himself during the later hours of the day. The temperature had been taken under these circumstances and found to be from 102 to 104 F. The examination showed bilateral otitis media with a thin purulent discharge. Drooping or sagging of the membranous meatus and definite mastoid tenderness were absent. There was definite bilateral enlargement of the cervical lymph nodes, more marked on the left side.

The request to have the child placed in the hospital was refused at this time, but he was brought back to the clinic in two days. Because of the almost negative results of the examination it was felt that the clinical course might be caused by the cervical adenitis or pyelitis, as pus cells were found in the urine. The child was observed for five days. Then it was decided to explore the left mastoid. The right ear had stopped discharging and the drum was normal in appearance. The adenitis had rapidly disappeared and the urine had cleared under treatment. The roentgenogram of the mastoid showed a diploic type of mastoid process without apparent change of the walls of the cells.

Operation revealed hemorrhagic mastoiditis with a normal sinus plate. This was removed to expose the sigmoid sinus. The wall of the sinus was found to be very red and was seen to bleed from many petechial spots. Extensive exposure disclosed a fairly normal appearing dura. The sinus was not interfered with as there were no obvious signs of thrombosis.

Repeated blood cultures had been negative, but it was clear from the clinical course that if bacteremia was not present there was sepsis. The clinical course was not affected. The wound appeared to be in excellent condition. Careful inspection of the sinus led me to believe that thrombosis was still absent. I decided to expose the side that appeared to be unaffected. Definite phlebitis was found and uncovered in the same manner as on the opposite side. The immediate effect was striking: the child's septic look disappeared, and he brightened, did not complain, became interested in his food, and recovered quickly.

This case is one of my most interesting experiences in otology. In bilateral cases presenting clinical evidence of extension of the infection to the blood stream, I am always anxious about the welfare of the patients.

My experience in case 1 led me to believe that there was a strong probability of involvement of the blood stream from the side that appeared to be well. At least it was felt that exploration could do little harm under the circumstances. It was reasonable to expect that the same type of disease was present on this side and that even though the ear had stopped discharging the mastoid disease could be still active. This proved to be correct. Ablation of the sinus and section of the vein on the side previously operated on could not have had a good effect. The blood culture in this case was negative on several examinations, but the clinical course was such that one did not need a positive blood culture to make a diagnosis.

SUMMARY

During the last two years, nine cases have been observed in which early involvement of the blood stream from otitic and mastoid disease have been treated by surgical measures that were relatively conservative considering the gravity of the circumstances and the otologic tradition relating to the management of such cases. During the same period, it was necessary to ablate the sinus and section the vein in six other cases that presented a quite different pathologic process.

It would seem that whether or not the sinus is to be ablated and the jugular vein tied in cases in which the infection of the blood originates in the temporal bone at the time of the original mastoid operation will depend on the type of disease, the general condition of the patient, the pathologic process encountered and the judgment of the surgeon.

It is not to be inferred that early mastoid operation is indicated in all cases of otitis media and mastoiditis. It is suggested, however, that in early well chosen cases early complete mastoid operation in the course of the infection of the blood stream from the disease will take care of the disease in a satisfactory manner.

ABSTRACT OF DISCUSSION

DR. R. F. DAVIS, Portland, Ore.: If the blood stream infection is entering the circulation from a focus in the bone, with no secondary focus established in the sigmoid or jugular bulb, conservative treatment, as described by Dr. Lillie, must be sufficient. A most necessary need would seem to be for the surgeon to be sure that a secondary focus was not established, as possibly directly into the jugular bulb from the middle ear. A few experiences with metastases into the joints and lungs make one anxious to ligate and ablate the sinus as early as possible in those cases requiring it. Dr. Lillie's description of his cases will aid us in arriving at a decision as to the pathologic changes in these cases, and the conservative treatment indicated.

DR. JOSEPH C. BECK, Chicago: The emphasis laid on the gross pathologic changes in a mastoid of the hemorrhagic type is quite important. As Dr. Davis showed, the cells of the mastoid may appear practically normal except at one or two points. As to being conservative, when one talks about conservatism it is only as applied to the sinuses and not to the mastoid, because one may leave something there that will infect the sinuses.

DR. H. I. LILLIE, Rochester, Minn.: So far as the jugular bulb is concerned, I said search must be made for sufficient pathologic change to account for the symptom complex. If it was not to be found in the sinus, it would have to be found somewhere else. Blood transfusion has long been used as an adjunct, supportive therapeutic measure, particularly in this type of sepsis. It apparently supplies a protective mechanism with which the body fights infection. We first used blood transfusion as an adjunct treatment in 1918. In the first case I described, the blood transfusion apparently controlled the temperature and signs of sepsis, but the patient still had night pain, and we could not rely on that as a curative measure; therefore we explored and found an area of phlebitis at the upper turn of the sinus. By complete operation as I used the term I meant complete exenteration of the mastoid cells and purposeful exposure of the sigmoid sinus in the hemorrhagic type in which there are symptoms of extension of the infection to the blood stream, even though the plate of the sinus might appear normal.

DIVERTICULA OF THE STOMACH

REPORT OF FOUR CASES *

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Diverticula of the stomach are defined by Kaufmann [1] as circumscribed, more or less rounded or bag shaped protrusions from the lumen of the stomach, containing all three layers. They are rare and until recently had received scant attention in the literature. Tupper [2] found thirty-eight cases, including his own, reported in the medical literature up to 1923, and a number have been added since that time. Because of their rarity, a brief discussion of the condition itself and a report of our four cases may be of interest.

The first mention of gastric diverticula was in a report by Helmont [3] in 1804, but until the roentgen rays came into general use few additional cases were reported. However, during the past fifteen years a number of excellent papers on this subject have appeared, one of the most recent being by Kalbfleisch.[4] In it he reports one case and reviews the literature carefully. Åkerlund,[5] Tupper,[2] Emery [6] and others also have written excellent papers on this subject. Because of recent reviews of the literature we have made no attempt to include references to all the papers on the subject but have limited ourselves to a brief summary and a report of our cases.

CLASSIFICATION

Diverticula of the stomach have been variously classified, the usual primary grouping being false and true. The false, in fact, are not diverticula, for one or more of the layers of the gastric wall are missing. They usually are traumatic in origin and represent a herniation of the mucosa through a rent in the muscularis. True diverticula contain all layers of the stomach wall.

The various conceptions of the origin of true diverticula will be discussed later. Depending on our idea of their cause, they are subdivided into congenital and acquired types. The latter is usually assumed to be

* Read before the Section on Radiology at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 12, 1929.

1. Kaufmann, E.: Lehrbuch der pathologischen Anatomie, ed. 8, Berlin **1**: 562, 1922.
2. Tupper, E. E.: Diverticulum of the Stomach, Wisconsin M. J. **21**: 442-446 (March) 1923.
3. Cited by Kalbfleisch (footnote 4).
4. Kalbfleisch, W. K.: Diverticula of the Stomach, Am. J. Roentgenol. **20**: 218-223 (Sept.) 1928.
5. Åkerlund, Ake: Diverticula of the Stomach from a Roentgenologic Point of View, Acta Radiol. **2**: 476-485, 1923.
6. Emery, E. S.: Diverticula of the Stomach, Am. J. Roentgenol. **11**: 354-358 (April) 1924.

due either to the effect of intragastric pressure—the pulsion type—or to the pull on the gastric wall by adhesions—the traction type.

DIAGNOSIS

In the earlier cases reported, the diverticula usually were accidentally found at autopsy or were discovered in museum specimens. With the advent of the roentgen rays, most of the cases have been found during an examination of the gastro-intestinal tract. At the present time the diagnosis depends almost entirely on the roentgen examination.

The characteristic roentgen observations are a sharply defined, flexible walled, usually nontender shadow, projecting from the lumen of the stomach and connected to it by a narrow neck. The diverticulum frequently retains barium after the stomach is empty, and in the upright position a fluid level is usually seen. Examination of the diverticulum after resection shows the mucosa to be intact, forming the inner surface of the

Fig. 1 (case 1).—Stomach filled, showing diverticulum projecting from the side of lesser curvature of the cardiac portion.

diverticulum. The tissues about the orifice may be hypertrophied, but no evidence of ulceration is present. Microscopic examination shows all of the layers normally found in the gastric wall to be present, although they may be very thin. Evidence of inflammatory changes is seldom found.

Frequently in the cases reported the diverticulum has not been demonstrated at operation, although in most instances there has been no doubt in the mind of the operator of its presence. The difficulty in demonstration evidently is due to the inaccessible location of many of the diverticula, the small size of the opening into the stomach and the fact that seldom is there any induration of the tissues surrounding them.

ETIOLOGY

Most of the earlier writers considered diverticula of the stomach to be of congenital origin and cited Keith's [7] statement that they may occur normally in some animals, for example, in the pig, in support of their opinion. However, Hurst,[8] in a recent article, quotes Keith [7] as saying that diverticula in man are entirely different from those seen in pigs and that those of the cardiac portion of the human stomach are due to a structural weakness in the wall of this portion. Keith

Fig. 2 (case 1).—Twenty-four hour retention in gastric diverticulum; colon filled with opaque material.

believes that their origin is similar to that of the diverticula arising at the junction of the pharynx with the esophagus. In his opinion they are acquired and not congenital in nature. Most of the writers of recent articles subscribe to this view.

In the majority of the reported cases the diverticula have involved the cardiac portion of the stomach and except for one instance have been in the posterior wall near the cardiac orifice. The single exception was of the anterior wall and was reported by Ravenel.[9] This group, in our opinion, should be classified as true pulsion diverticula of the acquired type. The fact that they are so constant in their location, together with the peculiar structure of the gastric wall in this region, leads one to believe that they are of the acquired type, result-

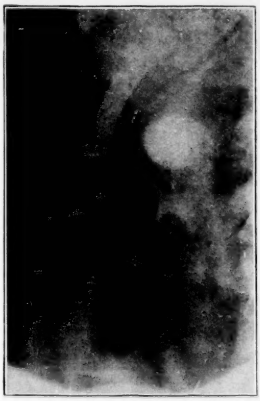

Fig. 3 (case 1).—Deformed gallbladder shadow fourteen hours after ingestion of tetraiodophenolphthalein.

7. Keith, Arthur: A Demonstration of Diverticula of the Alimentary Tract of Congenital or of Obscure Origin, Brit. M. J. **1**: 376-380, 1910.

8. Hurst, A. F., and Briggs, P. J.: Diverticula of the Stomach: A Possible Source of Error in the Radiological Diagnosis of Gastric Ulcer, Guy's Hosp. Rep. **74**: 413 (Oct.) 1924.

9. Ravenel, L. J.: Diverticulum from the Anterior Surface of the Stomach Near the Cardio-Esophageal Junction, Am. J. Roentgenol. **10**: 904 (Nov.) 1923.

ing from an inherent weakness in this part of the gastric wall.

The remaining reported cases have involved various parts of the distal two thirds of the stomach. There has been no constancy in their location, nor has any one proved that the gastric wall frequently is weak structurally in the regions where they have been found. Falconer,[10] Weichselbaum,[11] Nauwerck,[12] Kolb,[11] Wagner[11] and Gagenbauer[11] found pancreatic tissue in the walls. Nauwerck,[12] Gliński,[13] Cleve[14] and others believe that the misplaced pancreatic tissue responsible in some way for the diverticula. They believe that, in cases without pancreatic tissue in the diverticulum, this tissue may have been present earlier in the development but may have degenerated before the diverticulum was found. The etiology of this group demands further investigation.

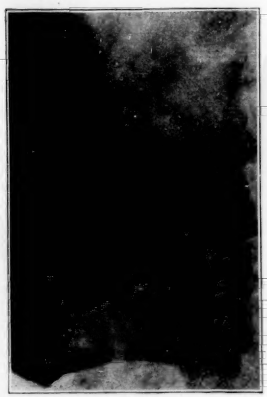

Fig. 4 (case 1).—Gallbladder shadow one hour after fatty meal.

An interesting group of diverticula of the body of the stomach with myomas in their walls, some of which were associated with severe and persistent hemorrhage, has been reported by several European writers, among whom are Puskeppelies,[15] Nauck[16] and Cleve.[14] The myomas were considered to have developed in preexisting diverticula. It is of interest in this connection that Rowlands[17] reported two cases of myomas of the stomach in which the main mass of the tumor projected into the lumen. The central portions of these tumors had degenerated, resulting in hollow, spherical masses. With these cases in mind, the thought occurs that the myomatous diverticula primarily may have been myomas projecting away from the lumen of the stomach, and that degeneration of the central portions may have been followed by invagination of the mucosa and consequent formation of diverticula. Sutherland[18] reported a case of multiple diverticula of the stomach associated with hemorrhage which may conceivably fall into this group.

Mayo[19] and Mellon[20] each reported a case in which a carcinoma was found at the base of the diverticulum.

Traction diverticula form another group. Their etiology usually is apparent at operation. Cases of this type have been reported by von Hanselmann,[21] Béclère,[22] Heubel,[21] Nauwerck[12] and Thorel.[3] They result from traction by adhesions usually secondary to an old ulcer, a cholecystitis, a pancreatitis or shrinkage of previously inflamed regional lymph glands.

Diverticula may be caused by pressure from a foreign body. Schulten[13] reports a case of this type due to the pressure of a trichobezoar.

SYMPTOMS

Symptoms in diverticula of the cardia, it is agreed by most writers, are either absent or inconstant. Yet a vague discomfort in the epigastrium at times amounting to pain, together with a sense of fulness beneath the lower end of the sternum, is frequently mentioned. Frequently associated with gastric diverticula are other pathologic conditions the proper treatment of which often causes the symptoms to disappear.

There is no constancy in the symptoms presented by the group of diverticula of the distal two thirds of the stomach mentioned or of those of the traction type. In the traction type the symptoms are usually secondary to the primary pathologic condition and not due to the diverticulum.

TREATMENT

In speaking of diverticula of the cardia, Jordan and Lahey[23] say that the treatment should be surgical, for irritation of the stomach contents may well be a predisposing cause of cancer in them; but they add that surgery in this region is frequently impracticable and often impossible because of difficulty in mobilizing and dissecting the sac. Thompson[24] attempted to invert one just below the cardia. This was found to be impracticable and the mouth of the sac was sutured, thus excluding it. A carcinoma has never been reported in a diverticulum of this group and the remote possibility of one developing, in our opinion, would in itself scarcely justify surgery. Postural drainage has been suggested as a treatment in these cases. It is of doubtful value but may be worth trying. In cases with other pathologic changes that may be responsible for the symptoms presented, in addition to a diverticulum of the cardiac portion of the stomach, it probably is wise to ignore the diverticulum and attempt to remedy the other condition.

Fig. 5 (case 1).—Demonstration of diverticulum at the second examination.

Diverticula of the distal two-thirds of the stomach, if associated with symptoms, justify surgical interven-

10. Falconer, A. W.: A Case of Congenital Diverticulum of the Stomach and Duodenum in a Physiological Hour-Glass Stomach, Lancet **1**: 1296, 1907.
11. Cited by Falconer (footnote 10).
12. Nauwerck, C.: Zur Kenntniss der Divertikel des Magens, Deutsche med. Wchnschr. **46**: 119-121 (Jan. 29) 1920.
13. Cited by Emery (footnote 6).
14. Cleve, A.: Divertikel und Divertikel myome des Magens, Virchows Arch. f. path. Anat. **255**: 373-383, 1925.
15. Puskeppelies: Virchows Arch. f. path. Anat. **240**: 361, 1923.
16. Nauck, E. G.: Ueber ein divertikulares Magenmyom mit totlicher Blutung, Frankfurt Ztschr. f. Path. **30**: 191-200, 1924.
17. Rowlands, R. P.: Myoma of Stomach, Guy's Hosp. Rep. **74**: 64-69 (Jan.) 1924.
18. Sutherland, C. G.: Multiple Diverticula with Hemorrhage in the Wall of the Stomach, Radiology **5**: 523-524 (Dec.) 1925.
19. Mayo, C. H.: Diverticula of the Gastro-Intestinal Tract, J. A. M. A. **59**: 260-264 (July 27) 1912.
20. Mellon, R. R., and others: The Incidence of Carcinoma in Gastro-Intestinal Diverticulosis, Surg. Gynec. Obst. **33**: 177-182 (Aug.) 1921.
21. Cited by Åkerlund (footnote 5).
22. Béclere, Henri: Ulcus petique et diverticule (controle opératorie) sur bouche de gastro-entérostomie pour ulcère juxta-pylorique, J. de radiol. et d'électrol. **7**: 161-163 (April) 1923.
23. Jordan, S. M., and Lahey, Frank: Gastric Diverticula, S. Clin. North America **6**: 754-756 (June) 1926.
24. Thompson, J. W.: Diverticulum of the Stomach, Brit. J. Surg. **14**: 180-181, 1927.

tion. Excision is the treatment of choice, for the possibility of the development of a malignant growth must be kept in mind. In the case of traction diverticula with symptoms, there is a definite indication for surgical intervention. In the presence of a foreign body in the stomach, with a resultant diverticulum, the surgical indications are likewise clear cut.

Fig. 6 (case 2).—Fundus of stomach filled; comma shaped diverticulum projecting downward.

REPORT OF CASES

CASE 1.[25]—A white woman aged 49, married, came to the office of Dr. E. S. Allen because of a sense of fulness, burning and discomfort in the left upper quadrant of the abdomen. Her family history was of no significance. She had had the usual diseases of childhood. Menstruation had been painful at all times until the periods ceased. The tonsils had been removed sixteen years before. Ten years before, she experienced an acute attack of pain in the right upper quadrant which lasted for approximately one hour. There was no relationship between the taking of food and the appearance of the attack. Attacks of this type continued at irregular intervals over a period of years. Seven years before, she had had an attack of unusual severity and had gone to the Deaconess Hospital, where she was seen by Dr. Allen and operated on. The operation revealed chronic changes in the appendix and gallbladder disease. The appendix was removed and the gallbladder drained. The patient's convalescence was uneventful and she was essentially symptom free for the following four years. After this interval she began to experience discomfort in the left upper quadrant associated with a burning sensation beneath the sternum. She could not remember whether this was the same type of pain that she had experienced before but believed that it was not.

During the past winter the attacks had become more frequent and were of unusual severity. On one occasion the patient lost consciousness. She was not jaundiced at any time, nor did she vomit. Examination by Dr. Allen Dec. 20, 1928, showed that she was poorly nourished. There was some tenderness on palpation over both the left and the right upper quadrants. The examination was not remarkable otherwise. She was referred to our laboratory for examination of the gastro-intestinal tract and gallbladder. Examination revealed a sac-like projection, approximately 3 cm. in diameter, extending medially from the posterior wall of the fundus of the stomach very near the side of the lesser curvature. It was approximately 1 inch above the cardiac orifice. The walls were flexible and there was no tenderness on palpation over it. It showed no tendency to empty when the patient was rotated into various positions, and when she was upright a fluid level was present. The stomach was found to be empty at the six hour period, but the sac-like structure remained filled with opaque material. It was still filled at the twenty-four hour period and was well demonstrated in films made at each of the observations. The gallbladder examination showed constant deformity of the shadow without impairment of function. Our impression at the end of the examination was that there was a diverticulum of the posterior wall of the fundus of the stomach and that there were adhesions about the gallbladder which were not interfering to any marked extent with the function.

The patient entered the Deaconess Hospital Jan. 23, 1929, and was operated on by Dr. Allen. He found numerous adhesions about the gallbladder, duodenum and pyloric portion of the stomach, together with a broad band of adhesions between the fundus of the gallbladder and the medial side of the anterior wall of the cardiac portion of the stomach. The adhesions were separated and pieces of omental fat were sutured over the denuded surfaces. Palpation did not reveal evidence of the diverticulum, and because of the other pathologic changes present it seemed unwise to make any further attempt to demonstrate it. Convalescence was uneventful and the patient was free from symptoms when seen five months after operation.

She returned to our office June 6, 1929, and the stomach and duodenum were reexamined. The sac-like shadow was again demonstrated, the only difference in its behavior being that in certain positions it emptied.

There was a small triangular pouch extending out from the anterior wall of the stomach where the adhesions were attached, and the operator's first impression was that this pouch was responsible for the shadow seen during the gastro-intestinal examination. Its location was entirely different, however, and subsequent examination demonstrated the diverticulum and again showed that the posterior and not the anterior wall of the cardiac portion of the stomach was the one involved.

It is likely that the adhesions and not the diverticulum were responsible for the patient's symptoms, although they may in some way have interfered with its emptying.

Fig. 7 (case 3).—Lateral view showing diverticulum well filled.

CASE 2.—A married woman aged 37, a private patient of Dr. Martin de Forest Smith, was admitted to the Presbyterian Hospital, New York, June 23, 1927, because of epigastric pain. About six months before admission she began to be troubled with cramps in the lower half of the abdomen, coming on half an hour after meals and continuing until relieved by magnesia magma or sodium bicarbonate. She also had gas and heartburn after eating. Three weeks before admission, a pain appeared

25. From the laboratory of Drs. D. Y. Keith, J. P. Keith and J. C. Bell.

high in the epigastrium associated with vomiting and unrelieved by diet.

Two days before admission, roentgen examination of the stomach disclosed a shadow projecting from the posterior wall near the lesser curvature. It was rather small and curved downward somewhat in the shape of a comma. In this pouch was found both a six and a twenty-four hour barium residue,

Fig. 8 (case 3).—Indefinite shadow projecting from the side of lesser curvature of the cardia as a result of a small amount of barium adhering to the walls of the diverticulum.

but no six hour gastric residue was found. Tenderness on pressure over the epigastrium was present. Otherwise nothing abnormal was noted. This was interpreted as a gastric ulcer, probably dissecting its way between two layers of the stomach wall.

Following the roentgen examination the epigastric pain became worse and the patient vomited a little blood. She was found to have a slight fever and was promptly admitted to the hospital. The white blood cell count was normal. After a few days on a Sippy diet the epigastric pain and tenderness disappeared.

A second roentgen examination showed the barium projection from the posterior wall of the upper part of the stomach to be no smaller than at the first examination. The pouch again contained a six hour residue, although the stomach was empty.

Exploratory operation was performed by Dr. F. B. St. John July 15, 1927. The clinical diagnosis was gastric ulcer. The operative note in part was as follows: The stomach appeared normal, as did the duodenum. Nothing could be palpated along the lesser curvature or the anterior or posterior wall, even after the stomach had been opened and the posterior wall actually palpated. In view of the roentgen observations, however, and of the patient's history, a longitudinal incision about 5 cm. in length was made in the gastric wall. Even then no evidence of induration could be found on the anterior or posterior walls of the upper third, but by carefully palpating within the stomach on the posterior wall about 4 cm. below the esophageal opening, one's finger entered a pouch with a crescentic fibrous band forming the distal portion of the ring. There was no evidence whatever of ulceration or induration. The pocket was smooth; the mucous membrane was normal. What one felt was apparently a diverticulum so high up that it was unapproachable surgically. The patient made an uneventful postoperative recovery.

CASE 3.—A married woman aged 30, a private patient of Dr. Edgar Stillman, was admitted to the medical private corridor of the Presbyterian Hospital, New York, in June, 1927, because of indigestion, which she had had almost all her life. The symptoms, details of which are not available, came on about one and a half hours after eating and sometimes could be relieved by food.

The gastric contents contained no free hydrochloric acid, but the total acidity was 60. The laboratory examinations otherwise were negative.

Roentgen examination of the gastro-intestinal tract disclosed a small rounded pouch about 1 cm. in diameter projecting from the lesser curvature just beneath the cardiac orifice, which contained a six hour barium residue. The stomach itself was empty in six hours. Between the fluoroscopic examination and the taking of the films, the pouch emptied and is shown on the films only by the barium sticking to its walls. The duodenal bulb filled out flexibly but there was a narrow impression across its junction with the second portion suggesting pressure from some outside structure. The examination otherwise showed nothing of importance.

The projection from the lesser curvature of the stomach was interpreted as a diverticulum because of its shape, smooth contour and six hour residue.

In spite of dietary treatment, the patient's symptoms persisted. In December, 1927, an acutely inflamed appendix was removed by Dr. John M. Hanford. After an uneventful postoperative convalescence, the patient has remained symptom free for the past year.

The disappearance of the previously persistent symptoms after appendectomy suggests that the appendix and not the diverticulum of the stomach may have been their cause.

CASE 4.—A business man aged 45 came to Dr. Allen O. Whipple at the Presbyterian Hospital, New York, in September, 1927, with the complaint of recurrent indigestion. In 1917 he began belching gas and noticed a sense of sourness in the region of the stomach. These symptoms were relieved temporarily by diet, alkalis and belladonna. At two roentgen examinations of the stomach in 1917, a small pouch was demonstrated projecting from the side of the lesser curvature of the fundus. In 1922,

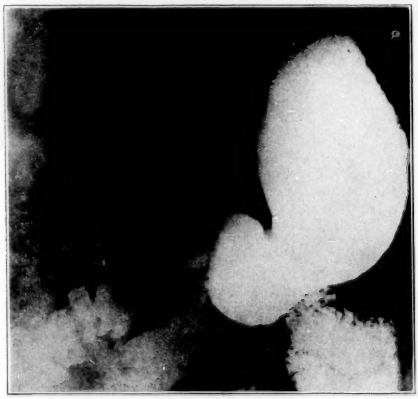

Fig. 9 (case 4).—Diverticulum of cardiac portion of stomach, ulcer of first portion of duodenum and diverticulum of transverse portion of duodenum.

with an especially severe recurrence of symptoms, the same pouch was again demonstrated by a barium meal and a fourth time in June, 1927. All other examinations were negative.

Roentgen examination of the gastro-intestinal tract at the Presbyterian Hospital showed the stomach to be high and hypertonic, with deep irregular peristalsis. No six hour gastric residue was found. After palpation of the stomach, barium was

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observed to flow into a pouch projecting posteriorly from the lesser curvature of the stomach just below the cardiac orifice. Otherwise the stomach did not show any abnormality. The duodenal bulb was markedly deformed. A budlike barium shadow projected upward from the lower part of the third position of the duodenum. At the twenty-four hour examination, a barium residue was found in the pouch projecting from the lesser curvature of the stomach. Attempts to empty this pouch by rolling the patient from side to side were unavailing. Our impression from the examination was that a diverticulum of the stomach, one of the third portion of the duodenum and an ulcer of the duodenal bulb were present.

Operation by Dr. Allen O. Whipple Sept. 19, 1927, disclosed a duodenal ulcer with adhesions to the surrounding structures. The diverticulum of the third portion of the duodenum could not be seen. The lesser curvature of the stomach was carefully explored and the interior was examined with a cameron light through an incision in the posterior wall made for a gastro-enterostomy. No evidence of a diverticulum of the stomach could be detected. Posterior gastrojejunostomy was done.

The patient's convalescence was uneventful and he has been free from symptoms for more than a year since the operation.

Dr. Whipple was much puzzled by his inability at operation to demonstrate the diverticulum of the stomach, of the presence of which he had no doubt. As the pouch did not fill with barium until pressure was applied over the stomach and as it could not be emptied at the twenty-four hour observation by rolling the patient around, it seemed likely that its mouth was merely a narrow slit which would be very difficult to detect with the stomach empty and small and with the mucosa thrown up into folds. As the symptoms have been relieved by the gastro-enterostomy, the duodenal ulcer was probably the most important of the three abnormalities demonstrated by the roentgen examination.

SUMMARY

1. Gastric diverticula are rare. They are seen most commonly in the region of the cardiac orifice.

2. The etiology of this condition is still an unsettled question.

3. Diverticula of the cardiac region are frequently symptomless and in themselves seldom justify surgical intervention. Those in other parts of the stomach often call for surgical treatment.

4. The roentgen observations, in most cases, are characteristic, and in many instances the diagnosis is made by this means.

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ABSTRACT OF DISCUSSION

DR. A. L. GRAY, Richmond, Va.: The authors' experience in exploratory verification, I am sure, is not dissimilar to the experience a great many of us have had. In these gastric diverticula, the upper pole of the stomach is hard for a surgeon to manipulate, and I am perfectly sure that the fact that the surgeon does not always find the diverticulum does not mean that the diverticulum is not present. I have had experience in several instances in which I was able, subsequent to the exploratory operation, to prove that the diverticulum was still there. So I do not think that we should put ourselves down as having made a false diagnosis, simply because the surgeon has not found the diverticulum on operation.

The Influence of Virchow.—Surely the contemplation of a life so noble in its aims, so notable in its achievements, so varied in its pursuits, may well fill us with admiration for the man and with pride that he is a member of our profession. The influence of his work has been deep and far-reaching, and in one way or another has been felt by each one of us.—Cushing, Harvey: Sir William Osler, vol. 1, page 355.

INFECTION OF ACCESSORY SINUSES AND UPPER RESPIRATORY TRACT IN VITAMIN A DEFICIENCY*

BURT R. SHURLY, M.D.
AND
R. G. TURNER, PH.D.
DETROIT

Experimental and clinical evidence has clearly established that deficiency of vitamin A produces a pathologic entity classified as xerophthalmia. The lowered resistance to infection and the development of lesions in the lacrimal apparatus, corneal ulceration and of infection of the nasal passages, accessory sinuses, middle ear, tongue, and upper respiratory tract are of particular interest to this section.

Fig. 1.—Comparison of control rat (not xerophthalmic) and xerophthalmic animal after thirty-six days on different diets.

The virulence of the micro-organism and the resistance of the cell to toxemia are underlying principles that determine the degree of pathogenesis.

We look to biochemistry to explain many of the mysteries that surround us in the various epidemics of influenza, tonsillitis, mastoiditis or diphtheria. Why does acute sinusitis, tonsillitis, acute laryngitis or mastoiditis prevail in epidemic form and change in type overnight to a greater or less degree of virulence and become engrafted on a new area of mucous membrane or lymphoid tissue? If the influence is climatic or microbic, the host with lowered resistance for the particular type of infection succumbs. An understanding of the true factors that determine this resistance may be dependent on a changing biochemistry of the cell with a changing virulence of the micro-organism.

As the problems of acute infection among children of school age with the attending loss to health and

* From the Research Laboratory of the Detroit College of Medicine and Surgery.

* Read before the Section on Laryngology, Otology and Rhinology at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 11, 1929.

* This article is abbreviated in THE JOURNAL by the omission of several tables. The complete article appears in the Transactions of the Section and in the authors' reprints.

education are of vital importance in a city with 229,337 school children, the Detroit Board of Education and the council appropriated $25,000 for research and the investigation of those problems of most importance.

One of us (R. G. T.) was selected to work with a committee from the medical college, to equip and supply a laboratory and begin with a study of the pathogenicity of certain bacterial organisms isolated from infections

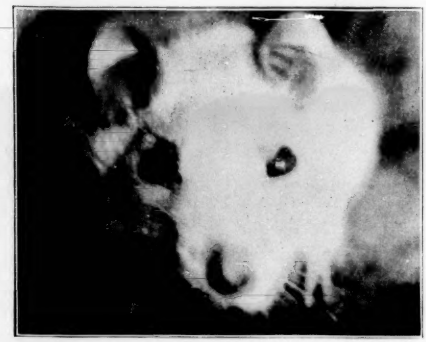

Fig. 2.—Disappearance of cornea and total blindness in xerophthalmic animal. Right eye shows presence of ulcer.

and suppurations of the nasal cavities and middle ear in albino rats deprived of vitamin A.

In this study, certain micro-organisms have been encountered. Gram-negative cocci and gram-negative bacilli were the outstanding organisms found in the suppurations of the infected animals examined during the summer months of 1928. These organisms are classified in a preliminary report [1] along with other organisms which were observed. Similar experiments conducted during the winter months and early spring are at present under investigation. Results of these experiments will be reported later. [6] It may be mentioned, however, that gram-positive cocci, chiefly *Staphylococcus aureus*, have been encountered more frequently than in the cases reported. They are also found in the control animals. Seasonal variation must be considered, since the flora of the upper respiratory tract in the human being varies considerably. Clark and Murphy [2] observed that the bacterial flora of the upper respiratory tract in seventy-nine cases of influenza, studied during the epidemic of 1920, consisted chiefly of gram-negative cocci. They remark that these organisms in some years have not infrequently been found as the predominating organisms in throat cultures and middle ear infection, while in other years they may occur rarely.

Gram-negative cocci of the upper respiratory tract in the human being, other than the meningococcus, are generally considered nonvirulent.

Ghon and Pfeiffer [3] in 1902 studied *Micrococcus catarrhalis* and concluded that the pathogenic significance is slight, though occasionally in catarrhal inflammation it may be a causative factor. Elser and Huntoon [4] in 1909 classified all gram-negative cocci and gave the opinion that these organisms, with the exception of the meningococci, have slight pathogenic properties. Clark and Murphy [2] report on a virulent strain of *Micrococcus catarrhalis*, stating that intravenous injection of a single culture into rabbits produced fatal termination in from two to three days. Gordon [5] in the same year, 1921, contributed an extensive study on gram-negative cocci of the upper respiratory tract of man in normal persons and in those with colds and influenza. He concludes that the organisms with which he worked possessed little or no virulence for the mouse and were practically avirulent for the rabbit.

TABLE 1.—*Virulence Tests on Rabbits with Forty-Eight Hour Broth Cultures Injected Intravenously*

Strain	Date	Amount Injected Cc.	Micro-Organism	Results	Age of Stock Culture
1	5/19/28	4	Chromogenic group 6	Died 36 hours	3 days
2	5/19/28	4	M. catarrhalis A	Died 36 hours	3 days
3	5/19/28	4	D. crassus	Died 36 hours	3 days
4	5/19/28	2	Unidentified bacillus	Lived	3 days
5	5/19/28	2	Friedländer-like bacillus	Lived	3 days
6	9/ 1/28	2.5	M. catarrhalis A	Died 96 hours	4 days
7	9/ 1/28	4	M. catarrhalis A	Died 24 hours	4 days
8	9/ 1/28	4	Friedländer-like bacillus	Lived	4 days
6	9/ 1/28	4	M. catarrhalis A	Died 24 hours	4 days
8	9/ 1/28	4	Friedländer-like bacillus		4 days
6	9/ 1/28 (filtrate)	4	M. catarrhalis A	Lived	4 days
8	9/ 6/28	4	Friedländer-like bacillus	Lived	9 days
6	9/ 6/28	4	M. catarrhalis A	Lived	9 days
8	9/ 6/28 (filtrate)	4	Friedländer-like bacillus		9 days
6	9/ 6/28	4	M. catarrhalis A	Died 36 hours	9 days
6	9/11/28	4	M. catarrhalis A	Died 48 hours	14 days
8	9/11/28 (filtrate)	4	Friedländer-like bacillus		14 days
6	9/11/28	4	M. catarrhalis A	Lived	14 days
9	10/ 6/28	4	Chromogenic group 6	Died 24 hours	4 days
10	10/ 6/28	4	Chromogenic group 6	Died 24 hours	4 days
11	10/ 6/28	4	Chromogenic group 6	Died 24 hours	4 days
11	10/ 6/28 (filtrate)	4	Chromogenic group 6	Lived	4 days
18	10/ 6/28	4	M. catarrhalis	Lived	4 days
19	12/15/28	4	Chromogenic group 6	Lived	10 days

Since a number of the gram-negative cocci isolated from the suppurations in the animals under investigation produced a fatal toxemia in rabbits, a more detailed study of the toxicity was undertaken.

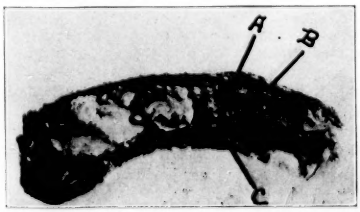

Fig. 3.—Position in nasal cavity from which cultures were taken. Suppurations were found generally in the ethmoidal-turbinal area and the posterior nasal aperture. Cultures were also taken from middle ear, eye and tongue abscesses.

This report compares the relative toxicity of both gram-negative organisms and gram-positive organisms isolated from the lesions of infected animals. In all, twenty-nine strains have been studied. The organisms tested have been classified according to their colony, structure, growth on common mediums, morphology, and action on carbohydrates. All of the organisms used were obtained from the nasal cavities, middle ear or tongue abscesses of pathologic animals.

1. Turner, R. G.: Proc. Soc. Exper. Biol. & Med. **25**: 233, 1928.
2. Clark, P. F., and Murphy, Eleanor J.: J. Infect. Dis. **29**: 306 (Sept.) 1921.
3. Ghon and Pfeiffer: Ztschr. f. klin. Med. **44**: 262, 1902.
4. Elser, W. J., and Huntoon, F. M.: J. M. Research **20**: 377, 1909.
5. Gordon, J. E.: J. Infect. Dis. **29**: 462 (Nov.) 1921.

METHODS

Two methods have been used for testing the virulence of the organisms. The first consists of injecting intravenously 4 cc. of a forty-eight hour dextrose broth culture in the marginal vein of a well grown young rabbit. This method was used by Dean [6] in testing the virulence of organisms obtained from sinus washings. The second consists of making a standardized vaccine for inoculation. The amount of vaccine injected to produce fatal termination varied from 0.5 to 5 cc. The amount necessary apparently depends on the age of the culture when the vaccine is made. Vaccines made from young cultures were found to be greater in toxicity than those made from old cultures. The age of the culture is interpreted as the length of time the organisms have been cultivated on artificial mediums. All vaccines were prepared from dextrose agar slants cultivated at 37 C. for twenty-four hours. The slants were washed once with saline solution before the suspensions

TABLE 2.—*Virulence Test on Rabbits with Standardized Vaccines*

Strain	Date	Amount Injected Cc.	Method of Injection	Micro-Organism	Results	Age of Culture
6	9/ 7/28	0.5	Intravenous	M. catarrhalis A	Died 36 hours	10 days
8	9/11/28	0.5	Intravenous	Friedländer-like bacillus	Lived	14 days
6	9/11/28	0.5	Intravenous	M. catarrhalis A	Lived	14 days
7	9/14/28	0.5	Intravenous	M. catarrhalis A	Lived	17 days
7*	9/14/28	0.5	Intravenous	M. catarrhalis A	Died 36 hours	17 days
6	9/14/28	1.0	Intramuscular	M. catarrhalis A	Lived	17 days
7*	9/14/28	1.0	Intramuscular	M. catarrhalis A	Lived	17 days
8	9/14/28	3.0	Intravenous	Friedländer-like bacillus	Lived	17 days
6*	9/17/28	3.0	Intravenous	M. catarrhalis A	Died 24 hours	20 days
6	9/17/28	0.5	Intravenous	M. catarrhalis A	Lived	20 days
6	9/22/28	3.0	Intravenous	M. catarrhalis A	Died 288 hours	25 days
12	9/22/28	3.0	Intravenous	M. catarrhalis A	Lived	17 days
13	9/22/28	3.0	Intravenous	M. catarrhalis A	Lived	16 days
14	9/22/28	3.0	Intravenous	M. catarrhalis A	Lived	17 days
15	9/22/28	3.0	Intravenous	Chromogenic group 6	Lived	16 days
16	9/22/28	3.0	Intravenous	M. catarrhalis A	Died 216 hours	10 days
17	9/22/28	3.0	Intravenous	M. catarrhalis A	Lived	10 days
9	10/ 6/28	5.0	Intravenous	Chromogenic group 6	Died 408 hours	4 days
10	10/ 6/28	5.0	Intravenous	Chromogenic group 6	Died 264 hours	4 days
11	10/ 6/28	5.0	Intravenous	Chromogenic group 6	Died 36 hours	4 days

* Vaccines made by suspending bacteria in filtrate from broth culture of Friedländer-like bacillus.

were made. This was done to guard against any possible so-called X substance, described by Zinsser, Kuttner and Parker [7] in the filtered washings from streptococci. The washings also removed any condensation water in the slants which might possibly have been of alkaline or acid reaction. The suspensions were made in saline solution and standardized by the capacity comparison method of Hine.[8] These standards correspond in opacity to McFarland's [9] standard number 3 used in the nephelometric method. The freshly prepared standardized emulsions were used for injection in the rabbit.

RESULTS

The results of animal inoculation are given in the accompanying tables. Tables 1 and 2 show the effect of broth and vaccine inoculation of gram-negative organisms. Organisms classified as *Micrococcus catarrhalis* A and chromogenic group 6 are shown to produce a fatal toxemia in rabbits. Table 3 compares the toxicity of twenty-four hour broth cultures of gram-negative and gram-positive cocci. *Micrococcus catarrhalis* A is apparently more toxic than any of the organisms classified as *Staphylococcus aureus*. Strain 24, classified as chromogen group 6, produced a fatal termination within four hours after injection. The organism had been grown on artificial mediums for forty-two days. This is not in agreement with the results of other chromogenic group 6 type organisms. Morphologically this organism is a gram-negative diplococcus by the Gram stain and ferments all sugars. A capsule stain of this organism taken from a milk culture showed the presence of a capsule. Capsules were not found in other strains of organisms classified as chromogenic group 6. It is thought that possibly this strain is a coccal form of a bacillus. Table 4 shows the comparative effect of successive injections of increasing doses of vaccine on rabbits. Results from this table show one strain of chromogenic group 6 to be much more virulent than any of the strains of staphylococci, while the other strain apparently produced an immunizing action or was nonvirulent. The toxicity of the staphylococci compares favorably with that of a known strain of *Staphylococcus aureus*. The indole-producing Friedländer-like organism produced death in the first rabbit when as much as 1 cc. was injected. A second rabbit lived after successive injections of 0.5, 1, 2 and 1 cc. Several strains of this type organism have been encountered. The organism produces indole, ferments all sugars and is encapsulated.

TABLE 3.—*Virulence Tests on Rabbits with Twenty-Four Hour Broth Cultures Injected Intravenously*

Strain No.	Date	Amount Injected Cc.	Micro-Organism	Results	Age of Stock Culture
19	12/15/28	4	Chromogenic group 6	Lived	10 days
20	12/16/28	4	M. catarrhalis A	Died 24 hours	11 days
21	12/16/28	4	Chromogenic group 6	Lived	11 days
22	12/16/28	4	Staphylococcus aureus	Lived	11 days
20	1/16/29	4	M. catarrhalis A	Lived	42 days
22	1/16/29	4	Staphylococcus aureus	Lived	42 days
23	1/16/29	4	Staphylococcus aureus	Died 72 hours	42 days
24	1/16/29	4	*Chromogenic group 6	Died 4 hours	42 days

* Showed presence of capsule in culture taken from milk.

TABLE 4.—*Effect of Successive Intravenous Injections of Increasing Doses of Vaccines on Rabbits*

	Amount Injected	Staphylococcus Aureus	Staphylococcus Aureus	Known Strain Staphylococcus Albus	Staphylococcus Aureus	Staphylococcus Albus	Chromogenic Group 6	Unidentified Bacillus	Friedländer-like B. Indole Producing	Known Bacillus Coli	Friedländer-like B.	Friedländer-like B.	Chromogenic Group 6
2/13/29	1 cc.	+	+	+	+	+	+	+	+	+	+	+	+
							Died 18 hr.		Died 18 hr.				
2/15/29	0.5 cc.	..	..	..	..	..	+	..	+				
2/21/29	1 cc.	+	+	+	+	+	+	+	+	+	+	+	+
2/23/29	2 cc.	+	+	+	+	+	+	+	+	+	+	+	+
2/27/29	4 cc.	+	+	+	+	+	Died	+	1 cc.	+	+	+	+
3/ 4/29	1 L	Died	+	+	+	+	..	Died	..	Died	+	+	+
3/ 8/29	.....	..	..	Died	..	..	..	..	..	..	Died		
3/11/29	.....	..	..	..	..	..	..	..	+	..	..	+	+

COMMENT

The most consistent results from the inoculation experiments were obtained with forty-eight hour broths. In table 1, two strains of *Micrococcus catarrhalis* A and four strains of the chromogenic group 6 type are shown to be virulent. Repeated tests with strain 6 show that

6. Dean, L. W., and Armstrong, Margaret: Ann. Otol. Rhin. & Laryng. **28:** 452, 1929.
7. Zinsser, Hans; Kuttner, Ann; and Parker, Julia T.: Proc. Soc. Exper. Biol. & Med. **18:** 49, 1920-1921.
8. Hine, T. G.: J. R. A. M. Corps. **25:** 424, 1915.
9. McFarland, Joseph: The Nephelometer, J. A. M. A. **49:** 1176 (Oct. 5) 1907.

Micrococcus catarrhalis has a tendency to lose its virulence with age. A broth made from a 14 day old stock culture of this strain did not prove toxic, while broths made from younger cultures produced fatal poisonous effects in rabbits. It was thought at first that this poisonous effect might be of an exotoxin nature. Filtrates of a forty-eight hour broth culture of strain 6 did not show any degree of toxicity. The same phenomenon was observed with strain 11 of the chromogenic group 6 type. Experiments carried out by injecting a broth of the Friedländer-like bacillus and a broth of virulent cocci into the same rabbit did not show any protective action on the part of the bacillus organism. The bacilli are usually found in the infected animals in the earlier stages of xerophthalmia and it was thought that they might be antagonistic to the gram-negative cocci, which are more abundant in the later stages of vitamin A deficiency. Filtrates of broth cultures of the Friedländer-like organism were also tried. In one case a strain of *Micrococcus catarrhalis* A, toxic in itself in one rabbit, did not have any effect on a second rabbit in which the bacillus filtrate was also injected. In two other cases the bacillus filtrate did not prevent death. One strain of the unidentified bacillus and one strain of an organism answering to the description of *Diplococcus crassus* were tested for virulence. The rabbit was not susceptible to bacilli, but the cocci produced a fatal toxemia.

Vaccines of both *Micrococcus catarrhalis* A and chromogenic group, table 2, are shown to be toxic to the rabbit. The results vary in the length of time required to produce death. In one case as little as 0.5 cc. of a standardized vaccine prepared from *Micrococcus catarrhalis* A produced death in thirty-six hours. In other cases as much as 3 cc. of like standardized strains did not prove fatal. The vaccine prepared from strain 6, injected Sept. 11, 1928, had previously been placed in the icebox for four days. Plates streaked from this preparation on the day of injection showed no growth. Its pathogenicity evidently was less because the bacteria in suspension were not living. All of the vaccines with the exception of the one mentioned were injected on the same day that they were prepared. A vaccine made from a twenty-five day stock culture of strain 6 did not produce death until the twelfth day, when as much as 3 cc. was injected. Others prepared from seventeen-day stock cultures, strains 12 and 13, were avirulent. This difference may be accounted for by the fact that the stock cultures of strain 6 had not been replanted as often as the stock cultures of strains 12 and 13. Accurate record of the subcultures made from stock strains was not kept. It is apparent, nevertheless, that the organisms become less virulent with age and subculturing.

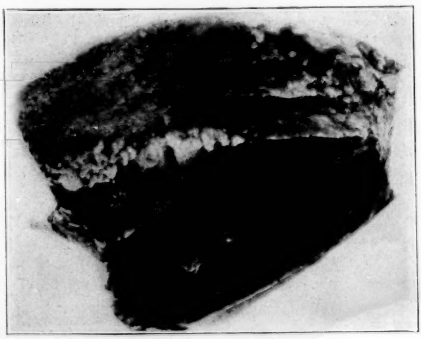

Fig. 4.—Liver of a rabbit at autopsy, death having occurred 264 days after the injection of 4 cc. of a forty-eight hour broth culture of chromogen 6. Rabbits killed by organisms classified as gram-negative cocci within from twenty-four to thirty-six hours showed no microscopic lesions at autopsy. In animals in which death was prolonged nine or more days, as the result of a lessened virulence of the strain from age, autopsies showed areas of focal degeneration in the liver. The amyloid and fatty degeneration of the liver shown here is produced by a chromogenic group 6 type organism. Micrococcus catarrhalis A has likewise been found to produce similar degeneration of the liver. This degeneration has not been observed with any gram-positive organisms, such as Staphylococcus aureus.

The strains of *Micrococcus catarrhalis* A seem to hold their toxicity longer than those of the chromogenic group 6 type. Three strains of the latter did not produce death in rabbits for from nine to seventeen days, when as much as 5 cc. of the vaccine was injected. The vaccines likewise were prepared from stock cultures only 4 days old. Broths made from the same cultures showed fatal effects in twenty-four hours or less. Vaccines made with broth filtrates of the Friedländer-like bacillus did not prove less toxic.

Intramuscular injections of doses of 1 cc. did not have any effect on rabbits.

Rabbits killed by organisms classified as gram-negative cocci within from twenty-four to thirty-six hours showed no microscopic lesions at autopsy. In animals in which death was prolonged nine or more days, autopsy showed areas of focal degeneration in the liver.

Of five rabbits in which death resulted from the injection of the chromogen 6 organism, cultures from the heart's blood of three showed like organisms, while the other two showed different organisms.

Gram-negative cocci of the nose and throat, other than meningococci, have not been thoroughly studied in grossly pathologic cases. The extensive study of meningococci during the World War did not include a study of other gram-negative cocci of the upper respiratory tract. Most of the investigators disregarded all cocci growing at 23 C. After the investigation of Elser and Huntoon in 1909 there was a lapse of more than ten years before a detailed study of gram-negative cocci again appeared in print. Following Gordon's work in 1921, little recognition was given these organisms until the late work of the English investigators Wilson and Smith,[10] who practically disregarded all the work of previous investigators and believed that the classification of these organisms on the basis heretofore given had not been substantiated. If organisms appearing morphologically as gram-negative cocci can be classified according to their action on carbohydrates, it then appears that these organisms are able to gain a pathogenic hold in the depressed state of their host produced, evidently, through deficiency of vitamin A.

CONCLUSIONS

Organisms isolated from the suppurations of the upper respiratory tract and middle ear in albino rats suffering from lack of vitamin A, morphologically appearing as gram-negative cocci and classified as such by their fermentative powers, may produce a fatal toxemia in rabbits. From the observations made it appears that the poisonous effect is produced by an

10. Wilson, G. S., and Smith, M. M.: J. Path. & Bact. **31**: 597 (Oct.) 1928.

endotoxin and not by a toxic substance secreted by the organism.

The toxicity of gram-positive organisms (*Staphylococcus aureus*) compares favorably with the toxicity of known strains of *Staphylococcus aureus*. Organisms classified as Friedländer-like, other than indole-producing strains, appear to be avirulent.

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ABSTRACT OF DISCUSSION

DR. RALPH A. FENTON, Portland, Ore.: Two questions arise regarding this study. First, were the isolated organisms tested for their hemolytic properties on mediums containing human blood? We have found the presence of marked hemolysis for human blood protein a helpful index of the pathogenecity, especially of the streptococcus and staphylococcus. Second, was any effort made in this study to compare the differential white count at various stages of the disease? We have found considerable clinical variation in the leukocytic defense of individuals, and it might seem wise to add a study of the relative percentage of lymphocytes to the other factors considered. Lowered resistance to infection as noted by increased lymphocytosis must be considered as an important element in the estimate of relative virulence of a given strain of bacteria in man. This experimental evidence that vitamin A deprivation will cause marked augmentation of the virulence of ordinarily harmless types of bacteria confirms our clinical experience respecting the impaired local resistance of starved, anemic or cachectic human beings. Such virulence will of course increase as the organism passes from one patient to the next in series. In other words, we have in the problem of mucosal infections a considerable number of variable factors. Vasomotor irritability, endocrine disturbance, allergic sensitiveness must all be considered in the human application of the valuable bacteriologic data adduced by Drs. Shurly and Turner.

DR. LEE W. DEAN, St. Louis: One might get the impression that this work is wholly experimental and not practical so far as the individual is concerned. About 1916 Drs. Daniels and Armstrong showed the influence of deficient diet on the paranasal sinuses. At the completion of their observations—about ten years ago—an infant ward was separated from the pediatric service and the infants in this ward were placed under the care of Dr. Daniels. About thirty new-born infants were taken and placed in the ward, and remainded in there until they were 2 years of age. During this time they were not under the supervision of a laryngologist or a pediatrician. It is interesting to note that during the first two years of the existence of this ward, notwithstanding the prevalence of infections of the middle ear and sinuses in the adjacent pediatric wards, there was not one case of serious acute infection of the middle ear or nasal sinuses in Dr. Daniel's ward. The infants in that ward were fed along lines indicated by the authors. In one instance an infant developed an infection of the upper respiratory tract. The second day of this infection Dr. Daniels thought it would be necessary to call in some member of the laryngologic staff. That was the only instance in which the need of the services of a laryngologist was considered. This infant was getting vitamin A in the diet, and on the second day Dr. Daniels conceived the idea of adding to the vitamin A diet vitamin B, because she has an idea that vitamin B aids in the absorption of vitamin A in the gastro-intestinal tract. By adding vitamin D to this infant's diet, the infection was controlled. About twenty of these infants are now 8 years old. They have been subjected to experiments along the same lines as Drs. Shurly and Turner's rats, except that there have been no deficient diets; they were all fed on equal diets. At the age of 2 these infants were adopted by people living in the neighborhood and their diets have been supervised up to this time. Every child has perfect teeth; there is not a carious tooth in any of these children. One child developed acute otitis that necessitated mastoid drainage. Dr. Daniels was working in Wisconsin at the time and she hurried home to see what the trouble was. She found that the mother was very anxious to see that the child got exactly the right food, and that she took the cod liver oil and shook it up with the milk, and then to be sure the child got rich enough milk she let the milk stand and skimmed off the surface, taking out just the thing that Dr. Daniels wanted the child to get. That is the only instance in which there was acute otitis in any of these children.

DR. GEORGE PINESS, Los Angeles: It is true that most infections will clear up or be materially restricted when the proper diet is given to the patient during the course of acute infectious disease, regardless of whether or not it was due to the group of bacteria reported by the authors. The question in my mind is whether or not the bacteria had any relation to the reduction of the patient's ability as far as resistance was concerned on account of the lack of vitamins in the ordinary diet that we all get. I feel that most children of the present day are given well regulated diets. Our children are now going to the pediatrician once a month for regulation of diet, and their diets are well planned; but despite all that they acquire sinusitis and other infections. I believe that the work of Drs. Shurly and Turner in infants might prove that the organisms presented may not have any relation whatever to this vitamin deficiency, but that perhaps in addition the vitamins which they are so deficient in might have a function when the patient is thrown in contact with a particular infection, either by contact with other children having the infection, or by going into swimming pools or making contacts of that nature.

DR. BURT R. SHURLY, Detroit: We want to give full credit to Dr. Dean and to Dr. Daniels, because it was really their exhibit that helped to give us the enthusiasm to take up another phase of this work. I hope this missionary work will grow in geometrical progression and that many other centers will be stimulated to take up some phase, because it does seem to me that with the virulence of the infection, this problem is present in everything we do. The keynote is in biochemical study. I want to call attention to the medical exhibit on vitamin B which absolutely proves that one can produce nasal hemorrhage or hemorrhage of the brain by vitamin B deficiency. I believe that much surgical work is done under conditions of lowered resistance, possibly caused by infections in the upper respiratory tract, which become virulent because the patient has no resistance. There is a rise and fall that is difficult to explain. There is a true scientific explanation, and I hope that a lot of centers will be developed and that a better understanding will be established of vitamin A and of the use of cod liver oil. The control animals certainly do prove that the resistance to infection with these particular germs is maintained. We can demonstrate that. Pathologic changes in the liver do not take place, whereas in rats in which the resistance is lowered, the pathologic changes appear. Dr. Fenton has asked about hemolysis and blood tests. We shall carry on these tests. We are spending our $25,000 liberally and I hope to be able to tell something later of the splendid work of my young staff of highly scientific laboratory men.

Importance of Physical Diagnosis.—I tell my students in physical diagnosis that it is the most important subject in their curriculum for three reasons: First, because it is diagnosis by one's own senses. The instruments of physical diagnosis you will always have with you—your fingers, your eyes and your ears. If you were cast up naked on a desert island, you could still be the scientific medicine man of the native tribe, provided you were a skilful physical diagnostician. Second, because it is an art, not a science. It is an applied art. Naturally so—it is the education of your senses to do certain things. To an art there is no end. You will always be learning something about physical diagnosis. You will never be perfect. It is the one thing you can never turn over to an assistant. Any more than Paderewski could turn over his piano to an assistant for a recital. You will always have to practice. Just as Paderewski always had to practice. Third, because everything you ever learn—about anatomy, physiology, pathology, symptomatology, chemistry, bacteriology—will make a better physical diagnostician of you. Everything you can learn will train your mind to direct your fingers and your eyes and your ears. Anybody can learn to do a mechanical procedure—and in a short time do it just as accurately as the most experienced.—Clendening, Logan: Physical Diagnosis, *J. Kansas M. Soc.*, November, 1929.

CHILDREN'S DENTISTRY *

CLIFFORD SWEET, M.D.
RICHARD GWYN WATSON M.D.
AND
HENRY E. STAFFORD, M.D.
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Dental care of the highest grade is necessary if the health problem of the child is to be solved.

No single health measure counts for more in preventive medicine than the maintenance of a healthy state within the mouth. It is evident that the mouth and its structures are the outposts along the route for the entrance of air and food into the body, and these necessities may at any time carry a cargo of pathogenic bacteria. If the outposts are impregnable, no foothold can be gained and invasion is prevented. On the other hand, if ready lodgment is offered within carious teeth and the diseased tissue that always surrounds them, the invaders find shelter, warmth, moisture and food in which to multiply and await the convenient season for forays into deeper and more vital structures.

Carious teeth not only become foci of infection but serve as avenues for the spread of infection. The carious process opens the pulp chamber; the pulp dies and becomes putrescent. Here, then, is dead tissue with blood and lymphatic connections so enclosed that edema or the production of gas raises the pressure within the infected area considerably above that of the surrounding structures. What conditions are lacking for the spread of living bacteria?

After the way of nature, the tooth sloughs off its putrescent pulp, leaving only its "bony skeleton" as a dead, infected foreign body [1] in place of the living, useful structure it once was. By this time, however, infection has gone through the dental tissue into cancellous bone and an osteomyelitis has established itself. Here as elsewhere osteomyelitis becomes chronic with the formation of dead bone (sequestrums) and fistulas through overlying soft tissue.

Dental caries is essentially a disease of early life.[2] Deficiency in prenatal nourishment, periods of rachitis or acute illness, especially at the time of crown formation on the tooth bud, as well as hereditary equipment with good or poor teeth, all have distinct and considerable bearing on this problem. The teeth when first erupted have long cusps and deep sulci with rough or uneven contours. With time and use the teeth are worn smooth; the opposing teeth become seated one to the other and serve as one polishing body against another. During the months and years while the process of wearing smooth is going on, particular care must be exercised or plaques [3] will form under which bacterial activity can go forward.

In the formation of the crown, perfect annealing may not take place, with resulting fissures and pits in which decay may readily get under way. Understanding and proper treatment of these conditions demands a dentist with a thorough knowledge of the developmental history and process of the teeth.

While, ideally, one hopes to prevent caries of the deciduous teeth, this is often impossible and cavities must be cared for. Cavities once present can be thoroughly prepared, with complete removal of all decay, and permanent fillings of silver amalgam or gold placed. Any treatment less thorough than this is inadequate and at best will fail to arrest the spread of dental caries. Temporary fillings of gutta percha or cement have no place in children's dentistry except they be in fact temporary and serve only for a few days until replaced by permanent fillings.[2]

Even though caries has advanced so far that the pulp chamber has been exposed and the tooth has died, it is still possible to fill the root canal and rebuild the crown, thus making the tooth relatively sterile and of use through the years of its allotted stay in the mouth. Deciduous teeth, though dead and containing filled root canals, seldom become reinfected; they lose their roots normally by absorption [4] as the permanent teeth press on them, and perform their normal part in maintaining jaw growth and occlusion for their permanent successors.

Osteomyelitis with fistulas through gum tissue does not necessarily demand extraction of deciduous teeth. The affected tissue can be removed surgically with dental burrs and the tooth treated as indicated in the preceding paragraph with satisfactory results in nearly all instances.

Deciduous teeth should not be removed unless their natural time for exfoliation is near at hand or unless the carious process has advanced so far that restoration is impossible or has proved impracticable after earnest trial. The permanent teeth depend on the deciduous teeth for freedom from caries and for maintenance of jaw growth. Both of these conditions are important, but the prevention of resident infection within the mouth is of the greater importance because of its relationship to the general health of the child. Consequently, even too early removal is preferable when this is the only possible way in which focal infection can be removed.[2] Therefore, deciduous teeth that cannot be restored satisfactorily should be removed at once.

The physician must be able to distinguish good from bad dentistry. At first thought, this may seem to present great difficulties. Reasonable interest and attention, however, soon make him sufficiently certain of his opinions to be of real assistance to his patients and to those dentists in his community who are also trying to help their child patients. He can easily recognize the temporary filling with its broken down, leaking margins and its surface eroded below the contour of the tooth. The filling, of whatever material, that is not contoured to restore as nearly as possible the original shape of the tooth is likewise easily recognized. Any filling that projects beyond the normal outline of the tooth is faulty. A satisfactory filling has a smooth, firm margin that is obviously water tight. Finally, any filling that falls out after a short time is not put in properly. This is a test that can always be depended on.

Physicians must carry on an incessant campaign of education and salesmanship if their child patients are to have the advantage of adequate dental care. Parents can be taught to appreciate the value of children's dentistry by the physician as they can be taught by no other person. They are accustomed to have his advice on problems of health. In this instance his advice has the added weight of being clearly devoid of self interest.

* Read before the Section on Diseases of Children at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 11, 1929.

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2. Fones, A. C.: Preventive Dentistry, Philadelphia, Lea & Febiger, 1925.

3. Alt, I. A.: Pediatrics, Philadelphia, W. B. Saunders Company, 1923, vol. 3, chapter 41.

4. Hogeboom, F. E.: Practical Pedodontia or Juvenile Operative Dentistry and Public Health Dentistry, St. Louis, C. V. Mosby Company, 1924.

Whenever a physical examination is made the mouth is examined and the opportunity presents itself to call attention to the condition of the teeth and ask, "When was this child at the dentist's?"

Many parents are not aware that the deciduous teeth are not all lost at or near the sixth year. When told that the two year molar is not lost until the child is 9 and often not until he is 14, they appreciate at once the need for dental care. This need is still more apparent when they are told, "The two year molar lives next door to the permanent six year molar for three to eight years," and they are asked, "If the two year molar decays, what may happen to his next door neighbor?" When told to take a child of 2½ or 3 years to the dentist, the parent usually asks in an anxious manner, "He has no cavities yet, has he?" The reply is: "I see none and hope he will never have any. Decay is a dis-

Average Cost of Children's Dentistry

Number of children	110	70	40
Average time cared for, years	6.45	6.45	6.45
First visit	$12.44	$18.32	$2.09
Follow-up care per year	$9.38	$10.27	$7.09
Initial repair and follow-up per year	$11.40	$13.11	$7.11
Total cost per child for 6.45 years	$73.57	$84.56	$47.82
Initial repairs, per cent of total cost	16.9	20.7	4.7

ease of the mouth. Once started, it is difficult and expensive to stop. If you owned an orchard you would not wait until it was diseased but would spray it regularly in order to maintain its health." The next question is, "I brush them regularly and that is enough, isn't it?" The answer is that brushing will not prevent the formation of deposits of calculus, under which decay can start.

Preventive dentistry is the only cheap dentistry. The average costs for a group of children who were given regular care for periods of from four to ten years, or an average of six and forty-five hundredths years, are shown in the accompanying table. This group was selected on the single condition that they remain continuously under care, reporting to the dentist at regular intervals of approximately four months. The costs are comparable since all the work was done by Dr. Charles A. Sweet and all charges were made on the basis of time consumed without regard to the nature of the operation.

In order to be effective, preventive dentistry must be kept up at regular intervals.[5] To impress this on the parents we often say to them, "You are going to the children's dentist. You will keep the return appointments he gives, at intervals of four months, two or three times. Then, if he finds no cavities to fill, you will stay away for one, two or three years. When your child has decayed teeth, you will return and will pay much more for repairs than preventive care would have cost over the entire period of your absence."

Dentists need to be taught and encouraged to do good dentistry for children. The physician must also assume a large part in this program of education. We have no criticism of the dentist who does not care to do children's dentistry and who frankly tells his patient so and refers the child to some one who will do it with the admonition to the parent, "Your child's dental care is important and when well done is worth a reasonable fee." However, for the dentist who says, "Oh, they are just baby teeth, let them go," because he is unwilling or unable to care for them properly, we feel that the criticism of lack of knowledge or selfishness may justly be made. Perhaps even worse is the dentist who does the child's work in a slipshod, careless, half-hearted, inefficient manner because he fears that he will lose the remainder of the family as patients if he fails to make this bluff. On the other hand, when good permanent fillings with well contoured and polished surfaces are seen in the child's mouth the physician can easily say to the parent, "Your child has excellent dental work in his mouth. Please congratulate his dentist for me." Or, better still, a telephone call or a note to the dentist encourages him to continue his endeavors.

Last week we saw a child who had many carious teeth. The mother said: "Oh yes, I know his mouth is in bad condition. My attention was called to it by Dr. D. Acting on his advice I went to three dentists, all of whom refused to do my child's work. I then consulted Dr. D., when he scolded me for not having my child's teeth cared for. I told him of my attempts to get the work done and asked him to refer me to a dentist. He had no suggestions to make." Incidentally, Dr. D. is one of the best known pediatricians in a large city.

Under the present law of several states, children may not be excused from school to keep dental appointments. The state tax funds are apportioned on attendance. School men rightfully insist on regular attendance at school and are loath to issue even lawful excuses except for sufficient reasons. As yet, school men as a group do not attach sufficient importance to dental care for young children.

Dentists who are qualified and who desire to serve the needs of children should be encouraged to give all their time to children. If appointments must be limited to the hours after school and Saturdays, no dentist can afford to limit his practice to children.

The duty of every community is to assist every child within it to make the most of his native gifts. The first of these, and the one on which all the others come finally to depend, is health. No child is in a perfect state of health who has disease within his mouth. Therefore, in every community the best possible dental service should be offered to children. The part the physician should have in bringing about this much to be desired condition is apparent.

242 Moss Avenue.

5. Lucas, W. P.: The Modern Practice of Pediatrics, New York, Macmillan Company, 1927, chapter 5.

ABSTRACT OF DISCUSSION

DR. WILLIAM WESTON, Columbia, S. C.: I do not think it is possible after listening to what the authors have said that conviction could fail to carry. They have presented the matter in so emphatic a manner and so clearly that what we have heard all our professional lives from dentists as to the difficulty of treating children we know now is true. They have told us that they could not get results because of the lack of absorption, and so forth. Any one who has taken the trouble to examine the authors' exhibit critically must be convinced that there is no more reason that a child's tooth should be neglected than that an adult's should be neglected. Of course, we all know the dangers of neglecting carious teeth. They are just as great in children as in adults, if not greater. Regardless of what any of us may say or may think, if we will examine the authors' exhibit we shall be thoroughly and finally convinced of the efficacy and truth of what they contend.

DR. W. P. LUCAS, San Francisco: There is no more beautiful dentistry anywhere than that which is done in the children Dr. Sweet and his co-workers supervise. The problem of dentistry about which they have been talking needs no further discussion. They pointed out the whole outline of it, and the only thing I want to add to the discussion, which is really not a discussion of the paper, concerns the effect of food. We know

that the children supervised by the authors do not have caries often, and we also know that without the food, dentistry would have little effect. Daniels has shown by feeding experiments that caries can be developed, progressively increased or brought to a standstill, if already present. I am sure that the authors would agree that if a child was on the wrong kind of diet, even the permanent fillings would have further caries around them. It is only by the combined efforts of a good pediatrician and a good dentist that good teeth can be insured.

DR. JAY I. DURAND, Seattle: About ten years ago I read a paper before this section on the question of children's teeth. My single original contribution was to show that, on examination of several thousand children in a community where sweetened condensed milk had been used largely for infant feeding, caries was very great among the children who had been raised on sweetened condensed milk. Since that time I have naturally been interested in the subject. The authors have covered only one phase of the subject, although it is an important one. The fact that the majority of Moro children in New Zealand raised in the English schools and under English living conditions develop as much caries as the English children, whereas their ancestors had not more than 2 per cent caries, shows that there is more to this than the dentist can correct. As I view this subject after several years of interest in it, it seems to me there are several factors to be considered. One is the proper formation of the teeth through proper feeding, not only of the infant but of the expectant mother, seeing that sufficient calcium, sufficient vitamins and sunlight are furnished to build up proper bony structure in the teeth. A second factor, undoubtedly, is the use which is given the teeth after they have erupted. Near the authors' exhibit is an exhibit on the muscular attachments to the bone, showing how quickly the bone goes to pieces when the muscular strain is released from that bone. I am strongly convinced that the use of the teeth and the proper methods of chewing are vital if we are going to preserve them. An English dentist states that in quite a large series of children who have been raised under his direction he has prevented caries by having every meal finished with something that would grind the starchy, sugar carbohydrate material out of the crevices of the teeth. A tooth brush will not remove this material from deep crevices. If the child finishes his meal by chewing a piece of cabbage, celery, lettuce, meat or orange, it will grind this decay-producing material out of the teeth and, to a large extent, protect them. I think the taste for sweets and the habit of not eating sweets between meals are important factors.

DR. CLIFFORD SWEET, Oakland, Calif.: We are not overlooking any phase of this problem. We are attempting to encourage every obstetrician we know in the care of the mother before the baby is born, so that there may be feeding of vitamins, exposure to sunlight, and care in the other things that are necessary. We are attempting to teach mothers the art of teaching their children to chew, and as early as possible we are asking them to stop puréeing food or furnishing it in any other soupy form. Because of lack of time and because it seemed to us that dental care is the one phase of this problem which is being neglected, we have not mentioned the effect of vitamins and sunlight. Occasionally we get a child who is a real problem. There is one question which has been asked several times at the exhibit on which we did not touch here; namely, what are the grounds for deciding that deciduous teeth should be extracted? Deciduous teeth should be extracted when they are at or near the time of normal exfoliation. That, I think, needs no explanation. If the tooth is ready to be lost, it is not worth saving. Secondly, the tooth should be extracted if a competent children's dentist cannot restore it, or if he has made an honest attempt to restore it and because of the infection present has had to extract it later. I use my authority, as the medical adviser of the child, in demanding the extraction of deciduous teeth no matter what the judgment of the dentist may be if the child has a serious constitutional disorder, such as nephritis, nephrosis, recurrent acute rheumatic heart disease, rheumatic fever, or valvular heart disease, which makes it necessary to say that we must sacrifice the welfare of the mouth for the sake of the child's welfare.

THE ANTIEDEMIC ACTIONS OF CALCIUM IN EXPERIMENTAL IRRITATIVE EDEMAS*

M. L. TAINTER, M.D.
AND
WILLIAM VANDEVENTER, A.B.
SAN FRANCISCO

Calcium therapy in edemas of irritative and inflammatory origin is known to be capricious. The claims of specific, antiedemic action appear to have more an authoritative than a scientific basis. The specificity is frequently attributed to certain known antipermeability effects of calcium on cells, unicellular organisms and simple membranes in general biology. However, there has not been any satisfactory evidence to corroborate this theoretical possibility in the antiedemic actions. A mere protective action against the formation of edema or effusion is not conclusive evidence of antipermeability. Moreover, it is frequently overlooked that the form of calcium in the body is not comparable with that of the salts used in simple experiments.

Besides the antipermeability theory, no satisfactory explanation has been suggested to indicate the probable nature of the antiedemic action of calcium, when this occurs. From the clinical side this is easily understandable, because it is difficult, if not impossible, to control the various factors that may participate in the development and in the recession of edemas. Experimentally, however, there are types of irritative edemas which can be satisfactorily controlled because certain factors which influence their formation are well known; they are therefore well adapted to tests of antiedemic agents. Probably the most important influencing factor in prevention of edema is efficiency of the circulation. Calcium has toxic effects on the circulation which could determine its antiedemic action, yet this factor has not received the attention it merits. With this in mind, it was not surprising to find that the results with calcium in experimental edemas, reported in the literature, have been contradictory; these results, and the actions of calcium in general, are described in textbooks on pharmacology and need not be repeated here.

Other factors in the systemic action of calcium, though of subsidiary importance, are the "acidosis" resulting from such inorganic salts as the calcium chloride, the diuretic action related to the acidotic action, and a possible retarding effect on water absorption in the intestine. The latter would not enter into the antiedemic mechanism when calcium salts are injected. Diuresis is also not a factor in acute experiments. Hence, in the ordinary calcium therapy of irritative edemas these actions of calcium may be ruled out, which leaves the circulatory action as the most likely factor in the antiedemic action. Accordingly, we have attempted to correlate quantitatively this and other factors in the use of calcium in experimental irritative edemas, with the hope of obtaining valuable information on the probable nature and value of calcium as an antiedemic.

METHODS

Two types of irritative edemas were employed; namely, the local edemas of dermatitis and chemosis produced by mustard oil, and the systemic edema of paraphenylendiamine. Rabbits

* From the Department of Pharmacology, Stanford University School of Medicine.
* Read before the Section on Pharmacology and Therapeutics at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 11, 1929.

and cats were used throughout. The dermatitis was produced by applying mustard oil on a 1 cm. square of filter paper to the shaved abdominal skin for fifteen minutes, and the chemosis by instilling 2 drops of oil in the conjunctival sac, massaging gently for a moment to insure uniform contact. The edema of paraphenylendiamine was produced by injecting 0.2 Gm. per kilogram of the hydrochloride subcutaneously in rabbits and 0.12 Gm. per kilogram in cats. Generally, the diamine was given one hour after the last, or only, dose of calcium. This edema is manifested by a marked gelatinous swelling of the head and neck, involving especially the tongue and submandibular tissues. It appears in from one to two and one-half hours, and usually asphyxiates the animals in a few hours by obstructing the larynx or upper air passages. The mechanisms of these edemas have been extensively studied in this laboratory; the mustard edema is due to direct capillary injury independently of nerve reactions,[1] and the paraphenylendiamine edema to specific capillary injury in the regions of the head.[2] An extensive experience has enabled us to standardize these edemas for practical tests of antiedemic agents. The conditions governing their formation, the time of onset, and the course and variabilty of the responses are well enough understood to avoid false results.

Calcium was injected subcutaneously as a 5 per cent solution of the lactate; the chloride was found to be too irritating. All doses in this paper are expressed as grams per kilogram of body weight. The total dosage of calcium administered ranged from 0.5 to 2.8 Gm., the latter being the maximum which could be given without causing acute death. It was thought that, if such large doses of calcium could not protect against the edemas, there would be little chance of antiedemic action with smaller doses. The total amounts of calcium injected, however, were tried in single and divided small doses.

The blood calcium was determined in duplicate, 1 or 2 cc. samples of serum being used according to Clark and Collip's[3] modification of the Kramer and Tisdall method. Twenty-four hours was allowed for complete precipitation of the calcium oxalate, as suggested by Pincussen and Schimmelpfeng.[4] Two blood calcium estimations were usually made, a control before, and another after, administration of the calcium, the latter being at the end of the experiment or when the edema was at its optimum. More frequent determinations were not made, since the excessive loss of blood would have depressed the circulation and invalidated the results as to edema. The control blood calcium values were very constant, the median being 13.4 mg. per hundred cubic centimeters, with a range of from 10.2 to 16.9 in all the rabbits and cats used. The peak of the increase in blood calcium was found to be at the end of two hours after single injections of from 0.5 to 2.5 Gm. At the end of the third hour after injection, the blood calcium reached the control level; it remained unchanged at the end of the fourth hour and thereafter it fell steadily, being about one-third lower than the control at the end of forty-eight hours. This tendency to a prompt return to the normal or control level has been noted by previous investigators.[5] Therefore, the calcium lactate was given about an hour before the edema experiment was begun; in this way the peak in the increase of blood calcium would about coincide with the peak of the edema process.

Blood pressure was measured continuously in the majority of animals during the ordinary course of the edema process. The carotid artery was cannulated under urethane anesthesia and the pressure recorded from a mercury manometer on a kymograph; this procedure has been shown not to influence the course of the edema.[5]

The extensive data on changes in blood pressure, blood calcium, and the edema processes were summarized and the significant changes are presented graphically, according to increasing doses of calcium in individual animals. The severity of the edema of paraphenylendiamine was estimated from the degree and extent of the process of edema in each of the following regions, i. e., the tongue, neck, larynx and face, and was estimated from 0 to ++++, the latter representing the maximum response. If a rabbit or cat showed a ++++ edema in all four regions, i. e., a total of 16 pluses, it was called 100 per cent edema, a total of 8 pluses was called one-half, or 50 per cent, edema, and so on. The severity of the mustard dermatitis was expressed as closely as possible in terms of cubic content, from the linear dimensions of the squared areas, before and after treatment with calcium in the same animal; the changes were expressed as percentages of the control. The degree of chemosis was more difficult to estimate quantitatively, but the result in one eye, as the control, before treatment with calcium was compared with the result in the other eye after treatment with calcium. The nonappearance of chemosis after calcium was called zero per cent of the control response, and any swelling was expressed in percentages as best as possible. The dosage of calcium was plotted as the total dosage in grams per kilogram. The changes in blood

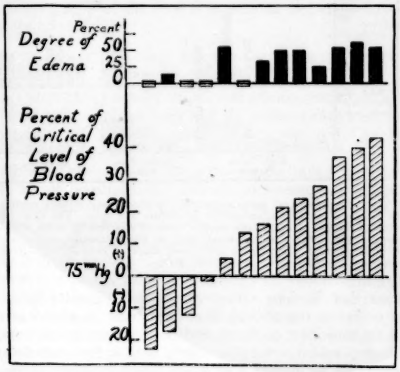

Chart 1.—Relationship of various levels of blood pressure to the degree of edema of paraphenylendiamine in rabbits. In all charts, each vertical column represents the changes in one rabbit; the plus sign means above, and the minus sign below, the critical, or 75 mm. of mercury, level of blood pressure.

pressure were plotted as percentage changes with reference to an experimentally established critical level of blood pressure. The bearing of these changes on the edema process may be discussed first.

RELATIONSHIP OF THE CIRCULATORY STATE TO FORMATION OF EDEMA

Probably no irritative edema can form during life without adequate intracapillary pressure and flow, factors which are intimately associated with the escape of plasma or serum from the blood vessels. This is nicely illustrated by the variable edema of paraphenylendiamine with changing levels of blood pressure, which in turn reflect the changes of intracapillary pressure. This factor is of such great importance to the proper testing of antiedemic agents that we have presented graphically in chart 1 the correlation between levels of blood pressure and the degree of edema in thirteen control, or untreated, rabbits.

It was previously found, and again confirmed in these rabbits, that a mean pressure of 75 mm. of mercury, lasting from two to three hours, was the minimum for production of the usual edema response. This value was called the critical level, and the percentage variation from it in the different rabbits indicated the state of circula-

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tory efficiency. Chart 1 does not leave any doubt that definite edema appeared in the majority, or eight, of nine rabbits with blood pressures from about 5 to 43 per cent above the critical level. In these rabbits the degree of edema was about 50 per cent on our arbitrary scale. The exact degree of edema is immaterial to the point at issue, as it was evident enough by con-

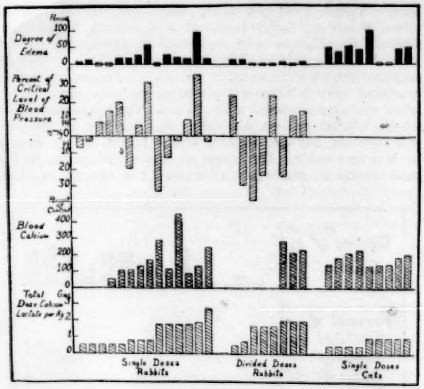

Chart 2.—Effects of calcium lactate, in single and divided doses, on the edema of paraphenylendiamine in rabbits and cats. The chart indicates the degree of edema, circulatory state as indicated by blood pressure changes with respect to a critical level of blood pressure, and changes in blood calcium according to increasing doses of calcium in individual animals (total thirty-one) in different groups.

trast that in four other rabbits with blood pressures at or below the critical level there was no edema at all in the majority, or three, and only a trace in one region of one rabbit. Clearly, therefore, a low circulatory efficiency, as indicated by a low blood pressure, is unfavorable to the development of edema. Thus the oversight of this important factor would lead to false conclusions concerning the antiedemic action of a drug. This may be the explanation of the alleged protective actions of calcium in experimental edemas. The same relationship between circulatory state and formation of local edemas holds as in the systemic edema of paraphenylendiamine. This has not been investigated separately but is clearly indicated in chart 3, which summarizes the results with mustard dermatitis and chemosis. It now remains to correlate the effects of calcium in the two types of edemas studied with the changes in the circulatory state.

CALCIUM IN THE SYSTEMIC IRRITATIVE EDEMA OF PARAPHENYLENDIAMINE

Chart 2 presents the results after single, large doses of calcium lactate in fourteen rabbits and nine cats, and after nearly the same total dosage of calcium in three or four divided portions, in eight rabbits. The single, large dosage of calcium ranged from 0.5 to 2.7 Gm. in the rabbits and from 0.5 to 1 Gm. in the cats, and the total dosage of calcium in the divided doses in rabbits ranged from 0.5 to 2 Gm. These doses were higher than those commonly employed in clinical practice. In several rabbits and cats, these doses undoubtedly caused toxic effects on the circulation, but not in all. For that reason divided doses were tried, but with essentially the same results ultimately as with single doses.

Collectively, the results showed that calcium per se, in the presence of adequate circulatory efficiency, did not exert any complete or uniform protection against the edema. This was true despite increases of blood calcium from nearly 100 to more than 400 per cent, which generally, though not invariably, followed the dosage of calcium. In the vast majority of the rabbits and cats receiving single doses of calcium, edema was definite, ranging in degree from 25 to 100 per cent, and nearly one-half the animals possessed edemas of about 50 per cent. One-half the rabbits receiving the calcium in divided doses showed edemas of less severity than those receiving single doses, namely from about 10 to 25 per cent, and the other half did not show any edema. Although the reduction or absence of edema in the latter rabbits would appear to signalize an antiedemic action of the calcium, this conclusion is not justified when the circulatory state is considered.

The outstanding characteristic event, which correlated with reduction or limitation of the edema by calcium in both single and divided doses, was circulatory depression. That is, the apparent antiedemic action generally, though not invariably, paralleled levels of blood pressure below the critical level necessary for production of the edema. This agreed with the correlated results on low blood pressures, occurring in rabbits without calcium (chart 1), and on absence of edema. From this it follows that the antiedemic effect in the animals receiving calcium was indirect, i. e., it was the result of

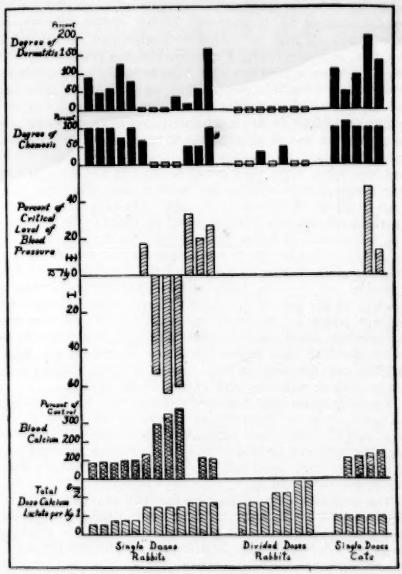

Chart 3.—Effect of calcium lactate, in single and divided doses, on mustard dermatitis and mustard chemosis of rabbits and cats. The arrangement of the results is the same as in chart 2.

circulatory inefficiency, which in turn was due to the calcium medication. At least six animals (chart 2) with blood pressures below the critical level, i. e., with low

circulatory states, showed definite edema, thus further emphasizing the inefficiency of calcium as an antiedemic. Obviously, the antiedemic action of the calcium was related to its effects on the circulation, really to intracapillary pressure and flow. The result of this effect was consistent with that of other measures, known to protect against this edema, such as epinephrine, which constricts arteries and reduces capillary flow. The importance of the circulatory state to edema formation has been neglected virtually in all previous researches on calcium in edema. Accordingly, therefore, all previous claims of antiedemic action of calcium must be regarded as erroneous or unproved. This would hold at least for severe edemas, but there might be still a possibility of specific antiedemic action of calcium in the less severe local edemas, as in chemosis and dermatitis, in which the claim has been made.

CALCIUM IN MUSTARD DERMATITIS AND MUSTARD CHEMOSIS

Chart 3 presents the results with calcium in mustard dermatitis and chemosis of rabbits and cats treated with single large doses, and in cats, with divided doses. The single large doses of calcium ranged from 0.5 to 1.8 Gm. in the rabbits. In the cats, only 1 Gm. doses were used. The total dosage of calcium in divided doses in rabbits ranged from 0.7 to 2.9 Gm., given in three or four portions during a twenty-four hour period.

Taking the results after single doses of calcium (chart 3), there is no doubt that an antiedemic action of calcium failed in the mustard chemosis and dermatitis of the vast majority, or fourteen, of the seventeen animals used. The protective action failed despite increases in blood calcium from 100 to 400 per cent. In fact, in four animals the degree of dermatitis exceeded that of the control responses; the chemosis remained about the same as the controls in ten of the fourteen animals, only four showing degrees of irritation of from 50 to 75 per cent. Three rabbits, receiving the highest doses of calcium, showed practically no dermatitis or chemosis, but the efficiency of their circulations was low, as indicated by levels of blood pressure below the critical level. Blood pressures were estimated in sufficient animals to indicate that dermatitis and chemosis generally occurred in those with pressures above the critical level. Thus, again, an apparent antiedemic action correlated with circulatory inefficiency.

In the seven rabbits which received the calcium in divided doses there was complete protection against dermatitis in all, and against chemosis in five, regardless of the dosage of calcium used. The blood pressures in the majority of these rabbits were not estimated, but one rabbit showed a pressure of only 46 mm. of mercury, hence, below the critical level. Since these rabbits were unable to stand and responded sluggishly to reflex stimuli, there was presumably a considerable degree of circulatory collapse in all. Accordingly, the apparent antiedemic action of the calcium was not surprising; it occurred indirectly as the result of circulatory inefficiency, and not as the result of a direct and specific antipermeability action of the calcium. Thus, the negative results with calcium in mustard dermatitis and mustard chemosis corroborated those in the edema of paraphenylendiamine.

PARATHYROID EXTRACT IN THE EDEMA OF PARAPHENYLENDIAMINE

Although it appeared clear that the negative results of calcium administration were not due to unavailability of calcium, it was possible that more gradual and sustained increases in blood calcium, such as might be produced by the administration of parathyroid extract, might produce an antiedemic action. However, we were disappointed in this, because from 6 to 30 units per kilogram of parathyroid extract-Collip injected subcutaneously in ten rabbits and cats did not have any demonstrable effect on the edema or on blood calcium. The nonresponsiveness of these species to calcium mobilization by the parathyroid may be the explanation of the negative results. In dogs and man, the results might be different, and favorable reports to this effect have appeared. Gold [6] has reported that parathyroid extract diminished pleural exudation from copper sulphate in dogs, but it is not clear whether this result was obtained at the expense of circulatory efficiency. Dogs, however, were not suitable for use with paraphenylendiamine. Cantarow and Gordon [7] have reported favorable effects on vesication of human skin and on intradermal injections of salt solution, although the interpretation of the results is difficult and they may be quite accidental.

DYE TESTS OF THE ALLEGED ANTIPERMEABILITY ACTION OF CALCIUM

The negative results of calcium administration in both the experimental systemic and the local irritative edemas obtained by us cast grave doubts not only on the reputed antiedemic action of calcium but also on its supposed antipermeability action in the intact organism. While it is admittedly difficult to attempt direct tests of vascular permeability in situ, the escape of colloidal dyes into the tissues has been employed from time to time as a criterion of increased permeability, especially in injured regions. For instance, Spagnol [8] has demonstrated increases in permeability of rabbit skin after the aplication of chloroform for ten seconds; the treated areas became promptly and selectively stained after intravenous injection of congo red, trypan blue and other dyes. Ingestion of the dyes by phagocytes, locally concentrated, however, may be a factor in the "selective" staining. It seemed to us that, if the regions in the edemas of paraphenylendiamine and of mustard dermatitis and chemosis should show "selective" staining with dyes before, but not after, calcium, the result might be interpreted in support of antipermeability effects of the calcium, although it might not be conclusive. On the other hand, if the irritated tissues were "selectively" stained, i. e., more markedly than the surrounding unirritated tissues, in spite of calcium medication the result would not be supportive of an antipermeability effect. It was the latter result that was obtained by us after injections of congo red and trypan blue (2 cc. of 1 per cent) intravenously into five rabbits with mustard chemosis and mustard dermatitis, treated previously with 1.7 Gm. of calcium lactate; the deep staining of the irritated tissues was indistinguishable from that of similar irritated areas before calcium was given. Thus, there was no support for an antipermeability action of calcium by this method.

COMMENT

According to our results, calcium as an antiedemic, in experimental irritative edemas, is inert and useless, except as it may act at the expense of circulatory injury.

6. Gold, Harry: Prevention of Experimental Exudates by Parathyroid Hormone (Collip), Arch. Int. Med. **42**: 576 (Oct.) 1928.
7. Cantarow, Abraham; and Gordon, Burgess: Effect of Certain Factors Underlying Production of Edema, Arch. Int. Med. **42**: 939 (Dec.) 1928.
8. Spagnol, G.: Arch. f. exper. Path. u. Pharmakol. **137**: 250, 1928.

Our negative results corroborate those of Levy[9] in experimental edemas. The irregular and undependable results of clinical calcium therapy support, if anything, the negative experimental results. It might be argued that the experimental edemas used to test the question do not reproduce clinical irritative edemas. On the other hand, it would be difficult to deny that the fundamental pathologic processes caused by the agents of experimental edemas differ from those of food and drug idiosyncrasies, allergic states, skin irritants and the inflammatory reactions that are generally encountered in man.

The vascular permeability changes of experimental and clinical edemas may be assumed to be identical; but it was pointed out that the alleged specific antipermeability action of calcium on tissues and organs in situ is speculative and not supported by convincing objective evidence. Consequently, it can be definitely asserted that the antiedemic action of calcium, in irritative edemas, lacks a satisfactory experimental as well as clinical basis. Therefore, its clinical usage is irrational and its antiedemic efficiency overrated. Its use in other types of edema has not come within the scope of our work.

CONCLUSIONS

1. The antiedemic actions of calcium lactate, in single and repeated doses, were tested in the experimental edemas of paraphenylendiamine and of mustard chemosis and mustard dermatitis in rabbits and cats, under controlled conditions.

2. A protective action of the calcium in these irritative edemas was not demonstrable, except when circulatory depression resulted from the calcium medication. Parathyroid extract was also ineffective. These results corroborated the results of others using other and similar edemas. Together, these negative results support the irregular and undependable clinical results.

3. Consequently, the alleged, specific, antiedemic action of calcium lacks a satisfactory experimental basis, and the theoretical antipermeability effect of calcium on tissues and organs in situ lacks convincing evidence. The therapeutic usefulness of calcium in clinical irritative edemas is seriously doubted.

Sacramento and Webster Streets.

9. Levy, R.: Berl. klin. Wchnschr. **48:** 1322, 1911; Deutsche med. Wchnschr. **40:** 949, 1914.

Vaccination.—In England the most important of the experiments and experiences with vaccination with cowpox material were made by a farmer in Dorset, Benjamin Jesty. His attempt was the first successful vaccination of which we have authentic record and detailed facts. Jesty vaccinated his wife and two sons in 1774 and fifteen years afterward one of the sons was inoculated with smallpox material without any result, showing that the vaccination had been successful. The vaccination of Mrs. Jesty, however, was followed by so severe an infection that she nearly lost her arm, and indeed her life, so that Jesty never repeated the experiment. . . . After Jenner had published the results of his own work in 1798, there were many who from envy or from lack of correct knowledge of the circumstances attempted to belittle his achievement and to advance the claims of Jesty or others as having made the same observations before him; that there was nothing original in his discovery and belief in vaccination was widespread in Gloucestershire. None of these attempts, however, in any way have lessened Jenner's fame. He did not deny that he was well aware of the belief in his own country; indeed it was this belief that led to his interest in the subject, though it may be said that he probably knew nothing of Jesty.—Roddis, L. H.: Edward Jenner and the Discovery of Smallpox Vaccination, *Military Surgeon*, December, 1929.

POLIOMYELITIS *

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Poliomyelitis was made reportable in Maryland in 1910.

In 1928, out of the total of 289 cases reported, 127 occurred in Baltimore City and 162 in the counties. Allegany County reported twenty-nine cases during the year and Garrett County thirty-four; both had remained comparatively free from the disease since their high incidence in 1916 and 1917.

EPIDEMIC AND INTEREPIDEMIC YEARS

The tendency for the disease to recur with more or less constant periodicity has been observed in Maryland and other states and counties (chart 1 and table 6).

The first signs of a recrudescence of poliomyelitis in 1928 were detected in July. From January to June, single cases occurred in the counties and in Baltimore City. They were less numerous, however, than generally reported for that time of the year.

FOCI AND GEOGRAPHIC DISTRIBUTION

It appears impossible to trace the origin of the 1928 epidemic to any special focus, and the epidemic cannot

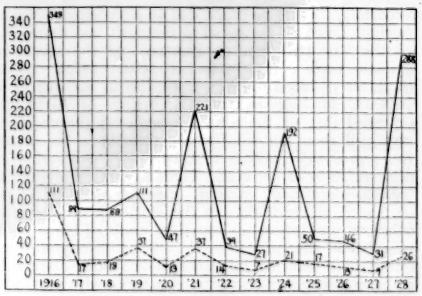

Chart 1.—Number of cases of poliomyelitis and deaths in Maryland from 1916 to 1928, inclusive. Fatalities per hundred cases: 1916, 31.9; 1917, 19.1; 1918, 20.4; 1919, 33.3; 1920, 27.7; 1921, 16.7; 1922, 35.9; 1923, 25.9; 1924, 10.9; 1925, 34.0; 1926, 28.3; 1927, 22.6; 1928, 9.0. Solid line, cases; broken line, deaths.

be regarded as having originated in any one special district. From the chronology and distribution of the cases, it seems more plausible that the epidemic originated in several widely separated districts. This is equally true for the rural districts and for Baltimore City, in which several foci widely separated were noted about the same time.

When the single cases are mapped, an obvious concentration with regard to distribution is observed. The principal interest of a focus from an epidemiologic point of view lies in the manner of growth. Starting at the center it spreads over neighboring areas, gradually placing new zones around older areas. Some of the districts which were severely affected in the 1916 epidemic almost entirely escaped the 1928 epidemic.

* Owing to lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the author's reprints.

* Read before the Section on Preventive and Industrial Medicine and Public Health at the Eightieth Annual Session of the American Medical Association, Portland, Ore., July 10, 1929.

MULTIPLE CASES IN FAMILIES

Infectiousness of the disease has been doubted, because of the large number of families in which only one case occurred. In 756 cases in the New York City epidemic in 1916, contact was an immediate factor in 20 per cent of the cases. In 8,635 families attacked in 1916, 4 per cent suffered from more than one case.

In 1916 in Garrett County, in one locality, the disease invaded the homes of thirty families. In twenty-two families there was only one case in each family; in six families there were two cases in each; in one family there were three cases, and in one family there were four cases. This tendency of family grouping coincides with the records of other observers. In Baltimore City in 1916 there were two cases in the same family in seven instances; five cases in the same family in one instance; three cases in the same family in one instance, and seven cases in the same house but in different families in one instance.

In the 1928 epidemic in rural districts there were two cases in three homes and three cases in one home. Aycock and Eaton,[4] from a study of a series of cases of multiple paralysis in 253 families, conclude that a large proportion of secondary cases can be traced to the same sources as primary cases. If in this review of the Maryland outbreak of 1928 are included patients showing mild symptoms, as fever, general malaise, vomiting and headache with apathy, in families in which known cases have existed, the number of multiple cases in homes would be materially increased.

In the investigation in Garrett County in 1916, definite lines of direct or indirect contact between cases were established, as follows: five cases were traced to a primary source in four instances; four cases were traced to a primary source in two instances, and three cases were traced to a primary source in one instance.

Several of these instances were in the same family, which bears out the observation of Aycock and Eaton[4] that a large proportion of secondary cases in homes are due to the same source.

The curve formed by plotting the cases for five day periods scarcely displays anything striking. It is the ordinary curve of the course of an epidemic with its typical rise during the summer and its almost abrupt decline in the fall (chart 2).

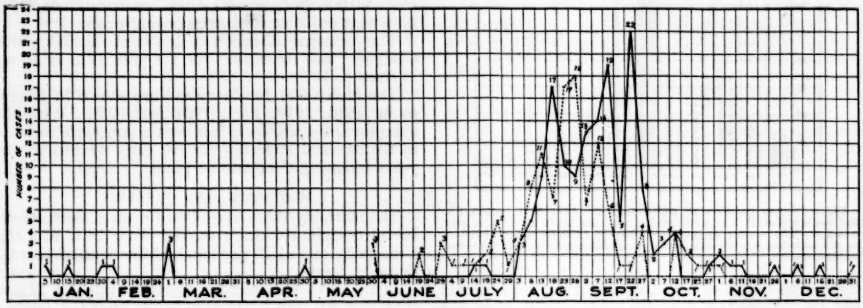

Chart 2.—Number of cases of poliomyelitis in Baltimore City and in the counties of Maryland in 1928, by five day periods: dotted line, Baltimore City; solid line, counties.

TABLE 1.—*Age Distribution*

Age	Maryland		Montana		California		Minnesota		Massachusetts		Total	
	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
Under 1 year.....	10	3.48	3	4.62	16	5.54	...	...	160	36.9	189	14.58
1 to 4 years.....	102	35.54	19	29.23	73	25.26	72	32.58	....	....	266	20.52
5 to 9 years.....	104	36.24	20	30.77	89	30.80	68	30.77	137	31.6	418	32.24
10 to 14 years.....	46	16.03	13	20.00	35	12.11	36	16.29	70	16.1	200	15.43
15 to 19 years.....	15	5.23	5	7.69	35	12.11	23	10.40	30	6.9	108	8.33
Over 20 years.....	10	3.48	5	7.69	41	14.18	22	9.96	37	8.5	115	8.87
Total.....	287		65		289		221		434		1,296	

The age distribution of cases in Maryland and in a few other states from which data are available for 1928 is shown in table 1.

An analysis of 1,521 cases which have occurred in Maryland shows that 68 per cent were in the age group 0 to 5 years. Frost[2] has called attention to the tendency for the disease in persons aged 6 years and over to increase with the progress of the epidemic. In Maryland, however, among the rural and urban cases the tendency for the older group to become infected with the progress of the epidemic was not noted.

This tendency for the higher age group to succumb to the disease as the epidemic progresses has also been noted in localized foci, as well as in family groups.

TABLE 2.—*Incidence of Poliomyelitis by Months for Maryland, 1928*

Months	Rural Maryland		Baltimore City		Total	
	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
January.....	4	2.48	0	0.00	4	1.39
February.....	1	0.62	0	0.00	1	0.35
March.....	0	0.00	0	0.00	0	0.00
April.....	1	0.62	0	0.00	1	0.35
May.....	0	0.00	3	2.38	3	1.04
June.....	0	0.00	5	3.97	5	1.74
July.....	5	3.11	12	9.52	17	5.93
August.....	59	36.64	66	52.38	125	43.55
September.....	72	44.72	28	22.22	100	34.85
October.....	12	7.46	8	6.35	20	6.97
November.....	5	3.11	2	1.59	7	2.44
December.....	2	1.24	2	1.59	4	1.39
Total.....	161		126		287	

In the latter group it has been frequently found that the older children are the last to become affected and

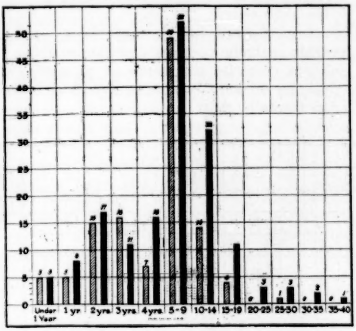

Chart 3.—Age incidence of poliomyelitis for 1928 in Baltimore City and the counties of Maryland: shaded area, Baltimore City; black area, counties. The number of cases occurring in children under 1 and up to and including 4 years was forty-eight in Baltimore City and fifty-seven in the counties.

these cases have also been the most severe, which bears out the observation that the virus increases as the disease progresses.

observation and has been referred to by Aycock and Eaton [4] and by other observers.

Frost [2] has noted that the seasonal distribution of cases in Iowa and New York was very similar during 1910 but that the period for maximum prevalence for the District of Columbia in the same year was approximately two months earlier than in either of those states.

Chart 5 shows the incidence in Maryland for the years 1916-1928.

The comparisons of the seasonal distribution of cases in table 5 have been made by states from which data were available for corresponding years.

The seasonal distribution of cases in Maryland, Glasgow [8] and Australia [9] for the year 1928 is shown in chart 6.

The high years for Maryland are shown in table 6 to be 1916, 1919, 1921, 1924 and 1928. With the exception of 1928, there has been a noticeable increase in the seasonal incidence for the early months of the years following the epidemic years.

MORTALITY AND FATALITY

The mortality rates have shown marked fluctuations. In thirty-eight epidemics studied from 1894 to 1921, a mortality rate of 20 per hundred thousand of population was found.

In the 1916 epidemic the mortality rate for Maryland was 8.0, the white population having a rate of 7.8 and the rate for the colored population being 10.4.

TABLE 3.—*Incidence of Poliomyelitis by Months for Maryland and Other States, 1928*

Months	Maryland		West Virginia		Virginia		Ohio		Minnesota		California		Total	
	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
January	4	1.39	9	4.74	1	1.01	14	4.81	0	0.00	32	10.77	60	4.32
February	1	0.35	2	1.05	8	8.09	10	3.44	1	0.45	53	17.85	75	5.41
March	0	0.00	3	1.57	3	3.03	10	3.44	1	0.45	14	4.71	31	2.23
April	1	0.35	0	0.00	5	5.05	5	1.72	4	1.78	19	6.40	34	2.44
May	3	1.04	2	1.05	5	5.05	9	3.09	4	1.79	30	10.10	53	3.81
June	5	1.74	6	3.16	4	4.04	4	1.37	3	1.34	27	9.09	49	3.53
July	17	5.93	6	3.16	17	17.17	24	8.25	7	3.12	20	6.73	91	6.55
August	125	43.55	69	36.32	21	21.21	72	24.74	37	16.52	30	10.10	354	25.51
September	100	34.84	48	25.26	9	9.09	69	23.71	90	40.18	24	8.08	340	24.51
October	20	6.97	31	16.32	16	16.16	44	15.12	42	18.75	22	7.41	175	12.61
November	7	2.44	9	4.74	5	5.05	24	8.25	28	12.50	19	6.40	92	6.63
December	4	1.39	5	2.63	5	5.05	6	2.06	7	3.12	7	2.36	34	2.45
Total	287		190		99		291		224		297		1,388	

Age incidence in Maryland and Baltimore City for the year 1928 is shown in chart 3. The number of cases for all ages by years, from 1916 to 1928, is shown in chart 4.

SEASONAL INCIDENCE

The distribution of cases throughout the state for 1928, by months, is shown in table 2. This table represents the seasonal prevalence of the disease in rural Maryland, Baltimore City, and the state as a whole.

For the state as a whole the greatest prevalence extends over the months from July to November, inclusive, with the peak of the epidemic reached in August, when 135 cases were reported, remaining high in September with 100 cases, and showing a gradual decline throughout the remainder of the year.

The seasonal incidence of poliomyelitis in 1928, 1916 and 1910 is shown for a number of states in tables 3, 4 and 5. With the exception of Virginia, the states represented in table 3 experienced an epidemic of poliomyelitis in 1927, a year in which the incidence of the disease was low in Maryland. The seasonal incidence in 1928 for West Virginia, Ohio and California undoubtedly represents an extension of the 1927 epidemic into 1928 rather than a higher incidence for the winter months. This is not an uncommon

For Baltimore City the rate for the entire population was 10 per hundred thousand.

The mortality rate for the United States registration area for 1916 was 10. In the same year New York had a mortality rate of 46 and Philadelphia 18.

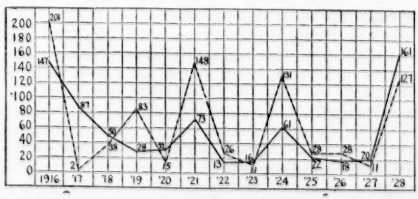

Chart 4.—Number of cases of poliomyelitis in Baltimore City and the counties of Maryland at all ages from 1916 to 1928, inclusive: broken line, Baltimore City; solid line, counties.

For 1928, a total of sixteen deaths occurred in the counties of Maryland and eleven in Baltimore City. Of the deaths which occurred in the counties, thirteen were among males and three among females. In Baltimore City, seven deaths occurred among males and four among females.

In the age group 0-4 years, ten deaths occurred; in the 5-9 year group, seven deaths were reported, and in the 10-14 year group, four deaths occurred. Of the total deaths one was in a child under 1 year of age and six were in patients over 15 years of age. Nicoll, in a study of fatalities in New York in 1916, found that the disease caused the greatest number of deaths among infants under 1 year of age and among persons over 15 years of age.

The fatality rate (the number of deaths per hundred cases) for Maryland for the years 1916 to 1928 inclusive has been relatively high. For the epidemic year 1916 the fatality rate was 31.9, and for the inter-epidemic year of 1922 the rate was 35.9. The year 1919 may be considered a high year with 111 cases and thirty-seven deaths, and a fatality rate of 33.3. The year 1925 was a low year with fifty cases reported and seventeen deaths, and a fatality rate of 34.0. In 1924 a total of 192 cases occurred with twenty-one deaths, a fatality rate of 10.9, and 1927, a low year, had thirty-one cases, with seven deaths, and a fatality rate of 22.16. The fatality rate for the epidemic of 1928 was 9.0, the lowest rate recorded during the period from 1916 to 1928. During the 1928 epidemic an intensive program for early diagnosis, hospitalization, serum treatment and observation of contacts was early inaugurated and the fatality rate of 9.0 was reached, the lowest recorded. It is believed that the measures instituted were largely responsible for the low fatality rate.

TABLE 4.—*Incidence of Poliomyelitis by Months for Maryland and Other States, 1916*

Months	Maryland		Ohio		Virginia		Minnesota		California		Massachusetts		Total	
	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
January	2	0.57	8	1.45	14	4.24	2	0.22	4	3.08	6	0.31	41	0.65
February	1	0.29	10	1.82	11	3.33	3	0.33	6	4.61	3	0.15	34	0.54
March	2	0.56	7	1.27	14	4.24	1	0.11	1	0.77	5	0.26	35	0.56
April	0	0.00	6	1.08	12	3.64	0	0.00	3	2.31	2	0.10	25	0.39
May	0	0.00	2	0.36	28	8.49	9	0.99	2	1.53	3	0.16	47	0.75
June	0	0.00	7	1.27	11	3.33	16	1.75	4	3.08	11	0.58	56	0.89
July	10	2.83	100	18.16	24	7.27	224	24.57	12	9.23	106	5.50	569	9.04
August	65	18.41	177	32.13	44	13.33	343	37.60	18	13.85	252	13.08	1,580	25.10
September	104	29.46	147	26.67	64	19.39	197	21.60	13	10.00	623	32.33	1,898	30.15
October	121	34.28	62	11.25	48	14.54	95	10.42	21	16.15	701	36.37	1,467	23.31
November	43	12.19	18	3.27	40	13.96	17	1.86	25	19.24	179	9.29	426	6.78
December	5	1.41	7	1.27	14	4.24	5	0.55	21	16.15	36	1.87	116	1.84
Total	353		551		330		912		130		1,927		6,294	

TABLE 5.—*Incidence of Poliomyelitis by Months in Several States, 1910*

Months	Maryland		New York		Iowa		Dist. Columbia		Minnesota		Massachusetts		U. S. General	
	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent	Cases	Per Cent
January	0	0.0	0	0.0	3	0.5	1	0.7	23	4.79	10	1.53	12	0.2
February	0	0.0	1	0.3	1	0.2	0	0.0	8	1.66	2	0.31	2	...
March	0	0.0	1	0.3	4	0.6	1	0.7	9	1.87	2	0.31	7	0.1
April	0	0.0	0	0.0	7	1.1	1	0.7	5	1.04	4	0.61	11	0.2
May	0	0.0	2	0.6	25	4.0	1	0.7	8	1.66	4	0.61	46	1.1
June	0	0.0	4	1.3	20	3.2	11	7.3	19	3.95	22	3.37	57	1.4
July	1	2.0	15	4.8	54	8.7	61	40.6	45	9.35	159	24.30	465	11.1
August	9	27.3	62	20.3	159	25.4	54	36.0	140	29.10	157	24.00	1,073	25.5
September	11	33.3	115	37.1	207	33.2	17	11.3	117	24.32	129	19.72	1,146	27.3
October	7	21.2	73	23.6	119	19.1	2	1.3	85	17.68	97	14.83	804	19.1
November	5	15.2	32	10.7	14	2.2	1	0.7	17	3.54	46	7.03	477	11.4
December	0	0.0	3	1.0	11	1.8	0	0.0	5	1.04	22	3.38	105	2.6
Total	33		310		624		150		481		654		4,205	

The first essential of the program was obviously the prompt reporting of cases. This was done by telephone or telegraph. Spot maps were kept at the office of the state and Baltimore City departments of health so that the geographic distribution could be easily seen. In preparation for a possible outbreak, the state department of health had engaged a diagnostician with special experience in this particular disease and had also made arrangements with the Johns Hopkins Hospital, the two orthopedic hospitals—the Children's Hospital School and the Kernan Hospital and School for Crippled Children—and the infectious disease hospital, all of Baltimore City, for the prompt hospitalization of cases from any part of the state. The hospitals had also agreed to supply convalescent serum whenever possible for the treatment of patients cared for in their own homes.

As soon as a case was reported, the patient was visited by the local health officer, accompanied by the special diagnostician. This insured confirmation of diagnosis, early hospitalization and, when hospitalization was impossible, thorough instruction as to the care of the patient, the precautionary measures to be taken to prevent the spread of the disease to others, and the importance of after-care. If hospitalization was not possible, convalescent serum was rushed to the attending physician.

Early in the outbreak, physicians throughout the state were warned of an approaching epidemic. A letter was sent to all physicians throughout the state, containing a summary of the symptoms and of the approved treatment and preventive measures. A second letter stressed the importance of the early use of immune serum and urged early hospitalization. A third letter dwelt on the necessity for prompt and competent orthopedic treatment and after-care of paralyzed patients to prevent the pain and injury that might come from indifferent handling of affected muscle groups. It was also explained that expert technic was required in the preparation and administration of human serum

INTENSIVE CONTROL MEASURES IN 1928

In order that the procedure followed may be better understood, it is necessary to explain that the population of Maryland is about evenly divided between the twenty-three counties and Baltimore City. Communicable diseases occurring in the counties are reported to the state department of health; those occurring in Baltimore City are reported to the Baltimore City Health Department. The white population of the state constitutes 85, and the colored 15 per cent.

and that in all probability patients would be much better taken care of in hospitals than in their own homes.

Convalescent Serum.—The convalescent serum furnished throughout the outbreak was collected from patients over 10 years of age, three weeks after the onset of the disease. Donors were all voluntary.

Immunization.—Owing to the limited supply of the serum, passive protection by subcutaneous injection of the serum, as advocated by Flexner and Stewart,[10] was not undertaken.

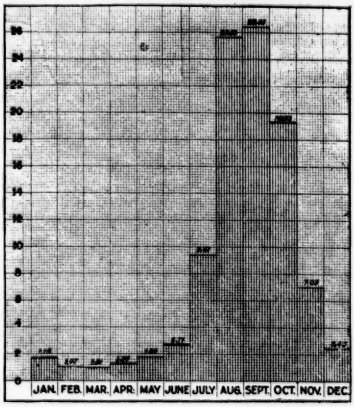

Chart 5.—Monthly distribution of cases of poliomyelitis in Maryland based on the experience of 1916 to 1928, inclusive.

General Preventive Measures.—The importance of persons rather than of things, as carriers of the disease, was carefully stressed. Since susceptibility is present, according to the generally accepted theories, in about 2 per cent of all children under 2 years of age, and obviously present to a marked degree in other age groups, isolation, with the usual precautions in the way of concurrent disinfection, promised more in the way of prevention than any other measure.

Publicity.—The public was kept informed as to the progress of the outbreak through bulletins furnished the daily and weekly papers. Hysteria was avoided by the publication of definite facts based on current morbidity and mortality records.

After-Care.—Follow-up care of cases by orthopedic surgeons, at specially arranged clinics held at conveniently located centers throughout the state, or in the homes by public health nurses, working under competent physicians, was inaugurated before the close of the outbreak and is still under way.

Cooperation of the Medical Profession.—The cordial cooperation with the public health groups of the general practitioners, as well as that of the orthopedic surgeons and hospital staffs, was an outstanding feature of the entire experience.

TREATMENT OF POLIOMYELITIS

Hospitalization.—We were fortunate in securing early hospitalization in the majority of our cases, which aided materially in establishing an early diagnosis and instituting therapeutic measures. Emphasis on early diagnosis bears repetition. The value of the spinal cell count as an aid to diagnosis cannot be overestimated. In 96 per cent of the cases in Baltimore the diagnosis was confirmed by spinal fluid cell counts. Experience has shown that the number of patients

TABLE 6.—*Poliomyelitis Morbidity in Maryland from 1910 to 1928, Inclusive*

Years	January	February	March	April	May	June	July	August	September	October	November	December	Total
1910	0	0	0	0	0	0	1	9	11	7	5	0	33
1911	2	0	0	0	1	0	0	0	6	3	3	3	12
1912	0	0	0	0	1	0	7	23	14	7	1	4	57
1913	0	1	1	0	0	0	2	3	2	1	0	1	11
1914	0	0	1	0	0	1	1	3	1	1	2	3	13
1915	2	0	1	6	3	4	17	23	7	3	0	0	66
1916	2	1	2	0	0	0	10	65	164	121	43	5	353
1917	7	2	2	0	2	2	22	25	19	7	0	1	89
1918	0	0	1	3	4	10	15	16	23	12	3	1	88
1919	0	0	1	1	5	3	11	31	27	22	9	1	111
1920	3	1	1	0	2	3	2	6	7	11	7	4	47
1921	2	1	3	2	0	9	25	48	56	55	17	4	222
1922	1	3	0	0	2	2	6	2	7	5	7	4	39
1923	2	4	2	3	2	0	2	2	1	2	6	1	27
1924	2	2	1	3	4	2	13	58	59	39	7	2	192
1925	4	2	0	3	1	5	6	5	11	11	1	1	50
1926	0	0	1	1	1	1	9	10	15	5	2	1	46
1927	0	1	1	0	1	1	1	1	5	11	5	4	31
1928	4	1	0	1	3	5	17	125	100	20	7	4	287

recovering without paralysis bears a direct proportion to the day of the disease on which the serum was given. That is, a larger number are benefited who receive the serum the first day of illness than those who receive it on the second, third or fourth day. The combined method of intrameningeal and intravenous injections

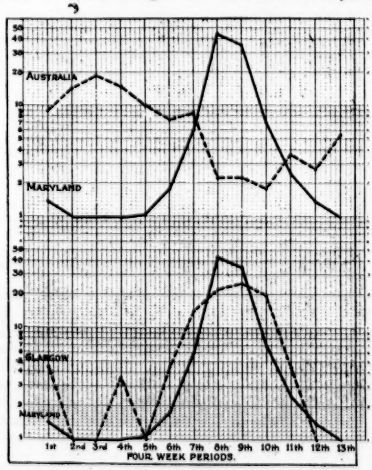

Chart 6.—Incidence of poliomyelitis in 1928 by four week periods, beginning with January 1 and ending with December 31.

given practically at the same time and the intraspinal injection repeated two or three times on successive days appears to produce the most beneficial results.

In a study of all the cases treated during the 1928 outbreak by G. P. Berry[11] of the Johns Hopkins Hos-

10. Flexner, Simon; and Stewart, F. W.: Poliomyelitis: Specific Prevention and Treatment of Epidemics, New England J. Med. **199**: 213 (Aug. 2) 1928.

11. Berry, G. P.: To be published from the Medical Clinic of the Johns Hopkins Hospital.

pital, it was found that, of forty-nine patients treated before the onset of paralysis, 92 per cent recovered entirely; of thirty-six treated shortly after the onset of paralysis, 40 per cent recovered. In a series of 184 untreated patients, all but fourteen developed paralysis and 30 per cent recovered. The latter is about the proportion of patients who usually recover without paralysis.

AFTER-RESULTS

Notwithstanding the cooperation of the people, the physicians and the hospitals in Baltimore, this epidemic has left behind some handicapped children. The orthopedic surgeons of Baltimore had hardly completed the necessary repair work of the victims of 1916 when they were called on for advice and treatment in the 1928 epidemic. About twelve years was allowed to elapse before it was realized that many deformities of previous outbreaks could be overcome. In the 1928 outbreak the orthopedic surgeon was called in during the febrile stage of the illness. Children in many cases were given adequate support of muscles, which will prevent deformities that would otherwise have occurred.

TABLE 7.—*Causes of Crippling in Children*

Diseases Causing Disability	Per Cent
Infantile paralysis	51
Tuberculosis	17
Congenital deformities	7
All others	24

In a recent survey (made by the Maryland League for Crippled Children), the causes of crippling in children were found to be as indicated in table 7.

In fifty-four cases investigated in the Maryland outbreak of 1928, the leg was found to be the most frequent single involvement. Table 8 shows the distribution of paralysis in this outbreak.

TABLE 8.—*Distribution of Paralysis*

Throat	1
Deltoid: right	1
left	1
Arm: right	1
left	0
Forearm: right	2
left	0
Thigh: right	2
left	0
bilateral	2
Leg: right	3
left	12
bilateral	4
Combination of Paralysis:	
Face and arm	2
Bilateral deltoid and left forearm	1
Bilateral deltoid, thighs and legs	1
Bilateral deltoid, left arm, right leg	1
Bilateral deltoid, arms and legs	1
Right deltoid and arm	1
Left deltoid and arm	4
Left deltoid, right arm	7
Left deltoid, thigh and arm	1
Left deltoid, arm, leg bilateral	1
Bilateral arms, legs	1
Right thigh and leg	1
Right arm, left leg	1
Left arm, left leg	1

Orthopedic and Educational Facilities.—Since poliomyelitis is responsible for the disability of so many of the crippled children, a brief summary of the care that is available for crippled children in Maryland is given.

There are two special hospitals in Maryland, both in Baltimore City, devoted exclusively to the orthopedic care of children: the Children's Hospital School, with a capacity of 120 beds, eight of which are for colored patients, and the Kernan Hospital and Industrial School for Crippled Children, with a capacity of sixty-two beds. Orthopedic cases are also admitted to the Johns Hopkins, University of Maryland, Mercy, Union Memorial and Church Home hospitals—all of them in Baltimore City.

There is one special school for crippled children in the state—the Sunshine School of Baltimore City—which has a capacity of 145 children and which is part of the public school system. When any of the children in this school require clinical attention, provision is made for their admission to one of the orthopedic hospital schools mentioned. The Baltimore City Department of Education assigns specially qualified teachers to these hospitals and the instruction of the children is continued while they are in the hospital, in ungraded groups if they are able to be about, and through bedside instruction during the long periods of complete incapacity which frequently occur. The Sunshine School provides instruction for children from the first and through the eighth grade. Any pupil qualified for junior or senior high school is sent to the nearest high school. Transportation is furnished by the department of education.

Work of the Service Clubs.—Bedside instruction of bedridden crippled children, unable to leave their homes, has been carried on recently in Baltimore City, under the auspices of the Baltimore Rotary Club. The department of education being unable to provide teachers for home instruction, the Rotary Club undertook the task. Upper class students at Goucher College—the number gradually increasing to six—who were taking the teachers' courses were secured, and about twenty-five children have been under instruction.

Other service clubs have assisted materially in the care of crippled children throughout the state, in providing transportation to clinics and to school, in aiding in the purchase of needed braces and other appliances, and in financing other special needs.

Recent Legislation.—By an act of the Maryland legislature passed last winter (session of 1929), provision is made for a census to be taken at regular intervals of physically handicapped children between the ages of 6 and 18 throughout the state and for the establishment of special classes or schools for those who are unable to attend the regular schools.

The bill defines the physically handicapped child as a child of school age who is or may be expected to be wholly or in part incapacitated for education or remunerative occupation by physical defect or infirmity, whether congenital or caused by accident, injury or disease and excluding the deaf, blind and the insane.

Physically handicapped children are to be examined by a representative of the state department of health and if found unable to attend the regular schools are certified to the nearest special school or class. Under the state board of education, special classes with a minimum of ten children in each unit are to be established in the counties. Provision is made for meals, nursing, therapeutic treatment and transportation.

Schools for this purpose, when built, are to be one story in height, and are to be provided with facilities for the physical well being, education and vocational training of the child. Nursing and medical supervision, nourishing food and necessary appliances are provided.

The Maryland League for Crippled Children.[17]—The recent legislation was adopted largely as a result of

17. Maryland League for Crippled Children: Crippled Child in Maryland.

the efforts of the Maryland League for Crippled Children, an organization that is the outgrowth of one formed thirty years ago by the local Council of Jewish Women for the purpose of supplying appliances for those unable to secure them. Slowly and effectively the activities of the league have been enlarged to include other phases of the care of crippled children. These have included the organization of special clinics in different parts of the state and the establishment of regular clinics in certain counties. Three county organizations are now working definitely as part of the league. Since the organization of these local clinics, fifteen clinics have been held and 376 patients examined. In 1928, through the efforts of the league, 1,029 children throughout the state were given orthopedic examinations, 653 in Baltimore City and 376 in the counties. Without regard to distance or to personal inconvenience, leading orthopedic surgeons of the state attend these clinics and give generously of their time and skill.

The Maryland League for Crippled Children was organized in April, 1927. An executive secretary, a medical follow-up worker, and a vocational guidance and placement worker constitute the paid staff. The league is financed by private contribution and membership dues. In cooperation with the state, city and county health departments, service clubs and interested individuals, local chapters are being organized throughout the state.

In accordance with the routine established for the clinics held under the auspices of the league, the notes taken by the examining orthopedist are written in detail and sent to the health officer, who arranges with the nurse to give the recommendations of the orthopedist to the family physician interested in the case. When hospitalization has been recommended, if it cannot be provided locally, admission is arranged through the office of the league.

The physician in charge of the clinics continues the care of his patients throughout hospitalization and follow-up care. A copy of the complete history of the case from admission to discharge is sent to the office of the league, so a complete medical history of the case is available for the physician when the patient returns to the clinic for observation and treatment.

In the medical follow-up work, the worker visits the family and arranges to meet the mother and patient at the clinic or takes the child, if necessary. She then assumes the medical follow-up work for the child over an indefinite period. If braces are ordered, the league pays for them in cases in Baltimore City; when the parents are not able to pay in the counties, the charge has been met locally.

For that group which has already reached the working age, a worker has been secured by the league to have a complete physical, orthopedic and mental examination made. In this way an employer may be definitely informed what the patient's condition is and a job or trade selected for him according to what he is able to do.

CONCLUSION

I take this opportunity to make a plea to the medical profession in general and to health officials in particular for the early diagnosis, hospitalization, early serum treatment, and after-care of poliomyelitis.

Diagnosis before paralysis is important. When a patient, especially a child, appears prostrated out of proportion to the temperature, with flushed face, an anxious expression, mild injection of the throat, rapid pulse, a coarse tremor or movement, the head tilted on the neck, stiffness of the spine and pain on anterior flexion, and an increase in the cellular and globulin contents of the spinal fluid, a diagnosis of poliomyelitis should be made and convalescent serum administered. No untoward results from the use of convalescent serum need be feared, and if there is an error in diagnosis it should be on the side of safety.

Early and repeated spinal drainage and the use of convalescent serum are most important in the preparalytic stage of the disease. When it is realized that the pathologic changes of this disease are located in the central nervous system, it is obvious that, to insure the minimum of paralysis and to obtain the greatest functional activity of the part, prolonged rest in the recumbent position is essential.

The number of patients with poliomyelitis recovering without appreciable paralysis during the 1928 epidemic in Maryland and in late epidemics elsewhere is most gratifying and encouraging.

The treatment of this disease under proper conditions, and in the hands of competent persons, reveals that between 70 and 80 per cent of the cases show good recovery as compared with 20 per cent receiving less intensive treatment.

Finally it may be stated that, under appropriate treatment, 90 per cent of the deformities which have followed in the wake of past epidemics may now be eliminated, and deformities as an after-result of this disease should entirely disappear.

Early treatment in this disease of all diseases is an absolute necessity. With the use of human serum, early hospitalization and the services of an orthopedic surgeon during the whole course of the disease, a low mortality rate, a very low average of total paralysis, a striking reduction in paralysis of the severe grade and complete prevention of deformities are to be expected.

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ABSTRACT OF DISCUSSION

DR. W. P. SHEPARD, San Francisco: In 1916 I was asked by Dr. Chesley to go over the records of 1,300 cases in Minnesota. In that early day he was keeping a record of his "abortive" cases of poliomyelitis. Since that time we have come to believe more and more that poliomyelitis with paralysis is a rather rare complication, and that from an epidemiologic standpoint it is almost impossible for us to make an intelligent study of poliomyelitis without in some way finding the so-called abortive or nonparalytic case. Our difficulty is to detect the abortive cases. In 1923 we were warned as early as April by our state board of health that it would be a poliomyelitis year. In Berkeley, a city of 80,000, the schools opened early, just about the time the epidemic struck the city. We were able, with an efficient nursing staff, to make daily injections of all school children and to adopt the rule that any child who had a fever of unknown origin or malaise, a gastro-intestinal upset or other symptoms was to be excluded from school and isolated for ten school days. We isolated about 1,500 children in eight weeks. A few came down with typical poliomyelitis shortly after isolation. At the end of the epidemic it was found that the death rate for Berkeley was less than one twentieth of that of the state as a whole, and our attack rate was approximately one-seventh that of the state as a whole. This in spite of the fact that we had the best of cooperation from the physicians in the city, and therefore obviously better reporting. Some way must be found to detect and isolate the abortive case of poliomyelitis, which often will start as a transient fever and slight gastro-intestinal symptoms. Such cases are responsible for the distribution of the epidemic. I should like to know Dr. Riley's opinion on how effective hospitalization was from the epidemiologic standpoint. His statement concerning convalescent serum is of special interest to us in California. The late

Dr. Fleischner was a great advocate of the use of convalescent serum. Since his death some additional studies have been made under the guidance of Dr. K. F. Myer, director of the Hooper Foundation. It is my impression that Dr. Myer is coming to believe that the use of convalescent serum, as far as monkeys are concerned, is not as good as we thought it was. I should like to ask Dr. Riley what he thinks the function of the health officer should be in locating and helping to collect convalescent serum.

DR. JAY I. DURAND, Seattle: In this disease, since we cannot see the infectious agent, and because it is so protean in its nature, it is difficult to evaluate methods of control or treatment. One year in Spokane, all cases were of the severe bulbar type, and nearly all of the first twenty patients died. The same year in Seattle, none of the patients I saw died. This was not due to any difference in treatment but to the entirely different character and virulence of the disease. Convalescent serum or whole blood given early is of value. This has been definitely established by Dr. Flexner's experiments with monkeys and the carefully controlled work in Massachusetts and elsewhere. While the epidemic is on, the diagnosis before paralysis is easy in most cases. As soon as one is reasonably sure of the diagnosis, convalescent serum or blood should be given. The preparation of serum for intraspinal administration takes time and is difficult for the average practitioner, and I do not believe it is necessary. In almost any community some one can be found who has recovered from the disease from one to ten years before. Such persons are almost always willing to donate their blood. From 30 to 50 cc. of blood should be withdrawn from the vein and injected into the muscles of the preparalytic patient; thus the danger of death or permanent paralysis will be greatly reduced.

DR. JOHN L. POMEROY, Los Angeles: I am particularly interested at this time in the statement relative to the care of crippled children. In California there are three different ways to care for crippled children. One is that the state board of health will advance the money, set up the clinics, and select the orthopedic surgeons, and then the county in which this work is done is billed for the cost. The second method is that if any person submits a petition to the superior court presenting evidence that the child's family is "needy," the court will order this work done, leaving it rather vague as to who is to do it. The third method is that the board of supervisors of each county may set up independently its own machinery to do it. The act does not specify any duties whatever for the local health officers. I have for several years been unable to get this question settled in my county. It can readily be understood that when the costs may be paid in three different ways, we have difficulty with our governing body in deciding which way to do it. For that reason it seems rather strange to me that any act would be passed in any state in which there were no duties given to the local health officers in the collection of data for treatment. We have been faced by a rather peculiar situation in our state, and I understand that this movement for the provision of crippled children was a national one fostered by certain clubs. I should like to ask Dr. Riley just what he is doing in Maryland, and whether the local health officer is placed in a position where he can organize this work with some authority.

DR. H. A. TREMAINE, Boise, Idaho: What is the procedure of making a spinal puncture in cases which do not show manifest meningeal development?

DR. R. H. RILEY, Baltimore: The effect of hospitalization certainly was not that of reducing the incidence of the disease (to any appreciable extent). The chief benefit, of course, was that which the patient received in proper diagnosis and treatment with convalescent serum. As to the question of convalescent serum and the difficulty the health officer has in securing it, of course it is the duty of the health officers to do anything they can for the welfare of the patient. They were instructed in our state to recommend that all patients suspected of having the disease go to a hospital. We had arrangements whereby they could go any hour of the day or night. If they came long distances they were able to get in a hospital within six hours at the latest after leaving their homes by automobile, and usually within twenty-four hours after the onset of the disease. It was the duty of the health officer in each county to see that hospital care was offered each suspected case, and to secure convalescent serum for all patients who for any reason could not be hospitalized. In the matter of securing convalescent serum, practically all the patients brought to the hospital were given serum obtained in the early part of the epidemic from out of state sources. There was not much difficulty in securing it after the epidemic had been in progress three weeks. In the homes in which the disease had occurred there were only a few people who refused to give us blood. Practically all patients treated in the hospitals furnished blood—some of them several times. This was particularly true of adults. Persons who made an uneventful recovery almost always showed their gratitude by contributing blood. As to the preparation of this serum, we think it should be prepared in the hospital unless whole blood is used. I think that in the circumstances referred to whole blood is very satisfactory. We recommend that the patients be brought to the hospital, if possible. The care of the crippled child is a matter largely in the hands of a voluntary agency, the Maryland League for Crippled Children. That is officered very largely by orthopedic surgeons and other interested citizens. They furnish their services and go out into the remotest parts of the state and hold clinics without charge. We have nurses in the field in every county in the state who know these children, and bring them back and forth to the clinics and follow them up. When it comes to providing braces and equipment for the crippled children, that is handled largely through the service clubs. In answer to Dr. Tremaine's question, no case of that kind was reported to the health department, so I cannot discuss the matter further.

Clinical Notes, Suggestions and New Instruments

ACUTE ASCENDING PARALYSIS: LANDRY SYNDROME

PROLONGED USE OF ARTIFICIAL RESPIRATIONS; DEATH AND AUTOPSY

CHARLES F. READ, M.D.; THOMAS E. CONLEY, M.D., AND HENRY H. CONLEY, M.D., CHICAGO

Landry in 1859 described an acutely progressive paralysis with slight or no sensory involvements and negative microscopic observations, noting recovery in some mild cases. The Oppenheim textbooks of 1911 and 1923 accept the syndrome as such, emphasizing the rapid onset of a flaccid paralysis without pain or especial tenderness and usually without marked disturbances of sensibility, death usually resulting from bulbar paralysis but recovery occurring not infrequently. A close genetic relationship to acute anterior poliomyelitis and polyneuritis is recognized, as well as the fact that inflammatory and vascular changes occur almost always in the cord.

Purves-Stewart [1] treats the syndrome throughout as Landry's paralysis, a condition of the lower motor neuron attributable to various infective agents. Wechsler [2] mentions a Landry type of poliomyelitis, and again a syndrome, usually without fever and probably toxico-infectious in character, in which recovery may occur. Jelliffe and White [3] view it as belonging primarily to acute poliomyelitis, "though in certain forms it is a neuritis," and state that "rabies also has its Landry's type."

Knutti [4] has recently described the rabic form, and there are a number of references in the literature to the syndrome following antirabic inoculation. However, during the past ten years comparatively little has been written on the subject, when reports on diffuse myelitis are excluded. The differentiation from acute polyneuritis seems to be exceedingly difficult at times; in fact, it often seems to be quite impossible during life. Postmortem observations often indicate involvement of the entire lower neuron, together with degenerative and reactive changes in the cord elsewhere than in the anterior horns.

1. Purves-Stewart, James: Diagnosis of Nervous Diseases, ed. 6, New York, E. B. Treat & Co., 1924.
2. Wechsler, I. S.: A Textbook of Clinical Neurology, Philadelphia, W. B. Saunders Company, 1927.
3. Jelliffe and White: Diseases of the Nervous System, ed. 5, Philadelphia, Lea & Febiger, 1929.
4. Knutti, R. E.: Acute Ascending Paralysis and Myelitis Due to the Virus of Rabies, J. A. M. A. 93:754 (Sept. 7) 1929.

Bradford[5] and others described in 1918 an "acute infective polyneuritis" in soldiers with a mortality of 26.6 per cent. Headache, fever and vomiting and backache preceded the onset with a quiet interval of some days, or even weeks, following which a flaccid paralysis suddenly appeared in the legs, progressing to the bulb in some instances. There was analgesia and anesthesia of the stocking and glove type, but spontaneous pain or pain on pressure was not a feature. Fever might occur; the white count rose as high as from 12,000 to 19,000, and the spinal fluid was negative. Peripheral nerve degenerations similar to those described by Brussilowski[6] were found, together with degeneration of the anterior horn cells and Clarke's column, without hemorrhage but with considerable round cell infiltration of the gray matter.

Casamajor[7] a little later reported similar cases in soldiers with cord conditions like those described by Bradford, but with marked reaction in the meninges. Bassoe[8] has reported ascending paralysis from a woodtick bite, without fever and with recovery, viewing the case as a toxic affair of the entire lower motor neuron. Mlle. Condat[9] has called attention to the changes in the peripheral nerves in ascending paralysis described by Dejerine, Strumpell and others, but offers no intra vitam differential diagnosis aside from the presence of nerve tenderness in the peripheral type (at times), and noninvolvement of the sphincters (present in Bassoe's case). She mentions, along with Ross Thompson,[10] cellular reaction in the spinal fluids of peripheral types and leans toward the idea of poliomyelitic infection in so-called primary cases, describing what she considers a classic case of the Landry type which corresponds very well with that observed by us, as detailed farther on.

Smirnow,[11] Pines and Maiman,[12] and Brussilowski have contributed substantially to our knowledge of the pathology of the so-called primary or essential form, this being, according to Pines, an illness *sui generis* which arises alone and proceeds quickly to death, showing histologically toxicodegenerative rather than inflammatory reactions dominating the picture. Pines cites similar reports by others and suggests an allergic reaction to gastro-intestinal toxins operating on a nervous system already weak and sensitized. Brussilowski in the case of a 2 year old child with typical clinical course found marked degeneration of the peripheral nerves—despite absence of sensory phenomena during life—vascular reactions without hemorrhage, and acute toxic changes in the cells of the anterior horns, in the posterior ganglions, and even in the cortex.

Taking everything into consideration, then, it would appear that the literature of recent years presents considerable variation in the reports concerning the pathology of Landry's syndrome—or, better, ascending paralysis of predominantly motor type—together with considerable doubt, during life at least, as to pathogenesis and the anatomic regions involved. In fact, it would seem quite impossible in the presence of the clinical syndrome as outlined to designate ante mortem just how and to what extent the lower motor neuron is involved, or just what cord changes are taking place, especially in the absence of an epidemic of poliomyelitis. The following case is thought worthy of report because the illness occurred in a young man of typical age, was unrelated to other disease save an indefinite sort of gastro-intestinal upset (in the absence of an epidemic), ran a classic course of progressive, flaccid paralysis without sensory manifestations, and presented the unusual feature of manual artificial respiration maintained over four days, with final bulbar death.

REPORT OF CASE

A. F., a white man, aged 23, was admitted to the hospital, March 5, 1927, because of pain in the abdomen, obstinate constipation and abdominal distention, together with weakness and dyspnea. These symptoms had all developed in the order named during the thirty-six hours preceding admission.

The patient was moderately well nourished with a medical history of influenza in 1918 and of pulmonary tuberculosis in 1925, for which he had been successfully treated in a sanatorium for two months. He had been employed at light labor for two years. One week prior to the present illness he had had several teeth extracted.

On admission he was so weak as to require assistance in walking, and breathing was labored. That night he suffered much distress because of abdominal distention and had to be catheterized. The following morning he became very cyanotic, and artificial respiration was instituted. The public service corporation employing the patient had trained its employees in giving artificial respiration in cases of gas poisoning and electrical shock, and four teams of two men each were detailed to this duty, working in fifteen minute relays applying intermittent pressure to the chest at the rate of 18 respirations a minute, one on each side of the patient as he lay in a semirecumbent position. The temperature rectally varied from 101 to 102 F. until shortly before death. The pulse varied with the respiratory embarrassment from 100 up to as high as 170 just before artificial respiration was begun. The lower limbs were completely paralyzed within a few hours and the arms became progressively weaker as time went on.

Spinal puncture on the third day of the disease gave fluid under no increased pressure, with ten cells and negative globulin, Lange and Wassermann reactions. The urine was normal; the leukocyte count was 15,800. These examinations repeated two days later gave the same results, save that the white count was then 21,000; later counts were 13,000 and 16,000, with normal red counts and hemoglobin. Blood culture, March 10, was negative; the blood sugar was 166; creatinine 2.4; nonprotein nitrogen 100, and urea 93; the Wassermann reaction was negative. Spinal fluid cultures were not made; a specimen, March 8, was said to show increased sugar content.

When first seen by one of us (C. F. R.) on the day following admission, the patient was propped up in bed with fellow employees constantly performing artificial respiration. He was using only the accessory muscles but was not cyanotic and directed the workers in occasional whispers. Whenever the procedure was interrupted, he became blue and seemed about to die. Neurologic examination under these circumstances revealed apparent bulbar palsy, only slight movement of the soft palate and uvula, with protrusion of the tongue to the labial margin, difficult swallowing and whispered voice. The pupils and the motor oculi, fifth and seventh nerves were normal. There was paralysis of the phrenic and intercostal nerves. The arms, hands and fingers could be moved weakly; no tendon reflexes were obtained and there were no atrophies. The lower extremities showed a complete, flaccid paralysis with entire absence of tendon reflexes. The corneal and plantar reflexes were the only superficial reflexes obtained, the latter by flexion. Sensation for touch, pin prick and position seemed unimpaired and there was no complaint of pain at rest or when the limbs were manipulated. There was retention of urine. The neck was somewhat stiff and there was a bilateral Kernig sign.

A diagnosis of Landry's type of ascending paralysis was evident. The absence of an epidemic, together with negative spinal fluid observations, inclined us against the idea of poliomyelitis, although the febrile reaction and high leukocyte count indicated a severe infection of some kind. The high sugar content of the spinal fluid, if reliable, was in line with similar observations in epidemic encephalitis, but there was nothing else in the picture to suggest this. Dextrose solution by hypodermoclysis was given freely, together with digifolin, ergot (Oppenheim), methenamine and, toward the end, oxygen. The patient did fairly well for several days, supervising the work of the artificial respiration crews and dozing a little at times. On the fourth day after admission—the sixth day of the disease—he seemed to swallow somewhat better but failed rapidly the following day and died of cardiorespiratory failure.

Autopsy by Dr. E. V. Fink, the hospital pathologist, revealed no evidence of bruising in the anterior chest walls despite 108 hours of manual artificial respiration. The pleural cavities

5. Bradford, J. R.; Bashford, E. F., and Wilson, J. A.: Quart. J. Med. **12**: 88 (Oct.) 1918, (Jan.) 1919.
6. Brussilowski, L. B.: Ztschr. f. d. ges. Neurol. u. Psychiat. **111**: 575, 1927.
7. Casamajor, Louis: Acute Ascending Paralysis Among Troops, Arch. Neurol. & Psychiat. **2**: 605 (Dec.) 1919.
8. Bassoe, Peter: Paralysis of Ascending Type in an Adult Due to Bite by a Woodtick, Arch. Neurol. & Psychiat. **11**: 564 (May) 1924.
9. Condat: Progrès. méd. **38**: 565 (Nov. 10) 1923.
10. Thompson, R. H.: Am. J. M. Sc. **175**: 807 (June) 1928.
11. Smirnow, J. L.: Arch. f. Psychiat. **78**: 599, 1926.
12. Pines, J. L., and Maiman, R.: Arch. F. Psychiat. **79**: 175, 1926.

were free; the apexes of both lungs showed old scars and there was passive congestion of the lower right lobe. The abdomen and its contents were negative. The brain was wet, with some exudate of fibrin on the parietal lobes near the central fissures; no exudate was seen at the base. The spinal cord was normal on inspection.

Dr. G. B. Hassin reported the microscopic observations as follows: The spinal cord showed throughout perivascular infiltrations, which were especially marked in the gray matter. The infiltrating cells were mainly lymphocytes, with plasma cells and polyblasts.

The blood vessels were not only infiltrated but greatly engorged; in many places there were very large hemorrhages. The ganglion cells were swollen and showed phenomena of chromatolysis and neurophagia. Glia cells were proliferated throughout the gray as well as the white matter, and in many instances formed nodules, especially in the medulla.

The changes were alike throughout the cord. They were very prominent in the medulla, where, however, they were not so marked as in the spinal cord. The meninges were but slightly involved and the roots were also infiltrated by hematogenous elements; especially the perineural spaces were involved. The microscopic diagnosis was acute anterior poliomyelitis.

30 North Michigan Avenue.

A MACHINE FOR MAKING REINFORCEMENTS FOR PLASTER CASTS

MYRON O. HENRY, M.D., MINNEAPOLIS

The machine illustrated here is now in use for making reinforcing pads for plaster-of-paris casts. The principle of the revolving drum was first presented at the clinic of Dr. Charles A. Stone of St. Louis.

Rolling plaster-of-paris bandage on revolving aluminum drum. Attention is called to the end of the bandage, which is caught in the slot; the plaster is rubbed into the crinoline after the bandage is rolled on the drum.

The present machine is a perfection of that idea, aluminum being used so that the drum is light but strong, together with other improvements.

Plaster-of-paris flaps are quickly and easily made with this device. The plaster can be thoroughly rubbed into the crinoline as the bandage is rolled on the drum. These flaps are especially useful and time-saving in making plaster-of-paris jackets, cylinders, boots and spicas.

823 Nicollet Avenue.

Council on Pharmacy and Chemistry

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EUGENE F. DU BOIS. LAFAYETTE B. MENDEL.
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Manufacturer.—The Quaker Oats Company, Chicago.

Composition.—Whole wheat, cooked, crushed, drawn out to filmy ribbon of wheaten threads. Wound round and round, baked, toasted to a butternut brown.

Process.—This is the same as for Irradiated Quaker Farina (described below).

Uses.—Irradiation of Muffets makes vitamin D available in a breakfast food for all ages except infants. The desirability of a proper "calcium balance" in adults is pointed out by leading food authorities in discussions of the problems of calcium retention. Muffets is appetizing, easily digested and made more nourishing by its vitamin D content. Not intended as a therapeutic agent to supplant the cod liver oil, but as a wholesome nourishing food. Because of the vitamin D, this wheat cereal is a more complete food than before.

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Manufacturer.—The Quaker Oats Company, Chicago.

Composition.—Irradiated Quaker Farina is simply this wheat cereal passed under the rays of ultraviolet lamps until it acquires vitamin D. There is no change in taste or appearance.

Process.—Steamed and thoroughly sterilized, the milled wheat is fed in a thin layer on broad moving belts which pass slowly under the glow of mercury vapor lamps. The rays penetrate to the thickness of the farina, but to make sure that the cereal receives uniform treatment it is forced through a "stagger" handling program by which all sides of the milled particles are exposed to the lamps.

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SATURDAY, FEBRUARY 22, 1930

STRUCTURE OF THE THYROID GLAND

Knowledge of the endocrine function of the thyroid and the application of that knowledge for the well being of the individual have made the thyroid gland one of the most interesting organs of the body. The structure was vaguely described by Galen. Vesalius described it more fully in 1543, and Eustachius in 1552 recognized that the isthmus is an essential part of the gland. In 1601, Casserius asserted that it was composed of two distinct parts. Wharton was convinced of its glandular character and included it in his Adenographia, published in 1656; he gave it its present name of thyroid gland. Although the names of these founders of modern anatomy are held in great veneration, the weight of their authority was not sufficient to settle some of the debated points concerning the gross anatomy of the thyroid. Perhaps the weight of individual authority was so great that unanimity of opinion was not reached concerning the single or double character of the organ or the presence or absence of a duct. Morgagni [1] still found it necessary in 1719 to describe the differences of opinion that had existed.

More modern times have added many illustrious names to the list of those who have contributed to our knowledge of the thyroid. Parry, Graves, Basedow and Gull, Kocher, Horsley and Halsted, von Graefe and Stellwag von Carion, Moebius, Bardeleben and Cruveilhier, Virchow and Langhans, Langendorff, Hürthle and Biondi, Baumann, Abderhalden and Oswald, and a still larger number of contemporary scientists have contributed to our information of the pathology of the thyroid gland. The histologic changes have been correlated with the iodine content of the gland and with the iodine store of the body. The hormone has been isolated, its structural chemical formula established, and its synthesis perfected. Wegelin's [2] recent monograph on the thyroid ends with sixty closely printed pages of bibliography.

1. Morgagni, J. B.: Adversaria Anatomica Omnia, Patavii, J. Cominus, 1719, Lib. 1, pp. 33-36.
2. Wegelin, Carl: Schilddrüse, in Henke and Lubarsch: Handbuch der speciellen pathologischen Anatomie und Histologie, vol. 8, Drüsen mit innerer Sekretion, Berlin, Julius Springer, 1926, p. 1.

In this wealth of labor and literature, the more minute anatomic structure of the normal gland has received scant attention. Statements made decades ago have continued to be accepted without question. The two excellent woodcuts that embellish the description of the thyroid in the second volume of Henle's [3] Handbuch der Anatomie would do credit to most current textbooks of histology. The gland has been described as being lobulated, the lobules of parenchymatous tissue being separated from one another by connective tissue capsules. The parenchyma has been described as composed of closed vesicles or follicles, lined by cuboidal epithelium and filled with the characteristic iodine-containing colloid material. Wolfert,[4] in 1884, described the occurrence in the adult gland of interfollicular groups or nests of cells that had not entered into the formation of follicles. Many textbooks of today still ascribe to such cell groups the formation of new follicles in the adult organ. The new formation of follicles is described as being brought about by the budding or outpouching of preexisting follicles. Only recently has this knowledge begun to be questioned.

Williamson [5] of England has presented an entirely new conception of the finer structure of the thyroid gland. The organ, he asserts, is composed of a number of lymphatic sinusoids, in which are suspended epithelial cords or cylinders. The secretion utilized by the body is delivered centrifugally by the epithelial cells into the sinusoids, from which it passes into the general circulation. Secretion not immediately utilized by the body passes centripetally to the middle of the epithelial cords, where it is stored in the form of the colloid so characteristic of the normal gland. The body, under normal conditions, depends for its thyroid hormone on small, scattered areas of what in the older teaching would be localized islands of hyperplasia. Rienhoff's [6] observations modify our older conceptions in certain respects but do not present so radical a departure from them as does the work of Williamson. Rienhoff used the methods of microdissection of the gland and of wax-plate reconstruction by means of serial sections of larger masses of tissue than had been previously reconstructed. By dissection it was possible to isolate the individual follicles. These vary somewhat in shape but are without exception smooth externally. Each follicle is surrounded by a thin covering of connective tissue which carries capillaries. The gland is subdivided into larger parenchymatous areas by the more prominent stroma bands, which give it its lobulated appearance. There is, however, no true lobulation in the sense that areas of parenchyma are entirely separated from one another by a complete covering of connective tissue. The latter forms a continuous, fenestrated meshwork.

3. Henle, J.: Handbuch der systematischen Anatomie des Menschen, vol. 2, Eingeweidelehre, Brunswick, F. Vieweg and Son, 1866, p. 540.
4. Wolfert, A.: Ueber die Entwicklung und den Bau des Kropfes, Arch. f. klin. Chir. **29**: 1, 1884.
5. Williamson, G. S., and Pearce, I. H.: The Structure of the Thyroid Organ in Man, J. Path. & Bact. **26**: 459 (Oct.) 1923.
6. Rienhoff, W. F., Jr.: Gross and Microscopic Structure of the Thyroid Gland in Man, Arch. Surg. **19**: 986 (Dec.) 1929.

The parenchyma, in its turn, is continuous throughout the entire organ. It occurs in the form of masses and plates of variable size, which are united to one another by narrower, shorter parenchymatous masses which pass through the fenestrations of the stroma framework. In the hyperplastic gland of exophthalmic goiter, the follicles are in general larger than those of the normal organ and are more irregular, but nothing that could be construed as budding or outpouching of follicles could be seen. The normal gland contains a relatively large proportion of small follicles, but these contain colloid. Undifferentiated follicles or interfollicular cell groups, like those described by Wolfert, were not observed in serial sections of either the normal or the hyperplastic organ. Although the outer surface of the follicle is always smooth, the inner surface may be irregular because of ingrowth and infolding of the epithelium. The embryonic development of the human thyroid gland, as described by Norris,[7] might be interpreted in favor of either of the foregoing views of the structure of the organ. The solid, cellular, epithelial anlage of the gland becomes subdivided early in its development by a system of cleftlike spaces. These might be conceived of as being the forerunners of the lymphatic sinusoids described by Williamson. According to Rienhoff, however, the clefts are filled in by mesenchymal tissue which grows into them from the capsule of the organ. It is this tissue that forms the fenestrated framework for the parenchymatous tissue. The views of Rienhoff are in harmony with the conceptions of the structure of the thyroid gland that have formed a working basis for several decades. They modify the older conceptions in certain details, which deserve consideration in the interpretation of the pathologic changes in the organ.

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THE MECHANISM OF ANTIGEN-ANTIBODY REACTIONS

The mechanism of antigen-antibody reactions has been an attractive subject for experimentation and speculation ever since the early days of immunology. The precipitin reaction, because of its technical simplicity, has often been used for such studies without, however, any agreement as to the fundamental nature of the mechanism involved. One of the great difficulties in interpreting the experimental results comes from the fact that the antigen is always a protein while the antibody is either a protein or always associated with protein, so that it is practically impossible to determine the relative amounts of antigen and antibody present in the precipitate formed. This difficulty has been met ingeniously by Heidelberger and Kendall,[8] who studied the reactions obtained when the antibody-containing fraction of type III pneumococcus antiserum, freed from the greater part of the serum proteins, is treated with the purified, nitrogen-free carbohydrates isolated from the pneumococcus. In these reactions, the nitrogen of the precipitates formed is due entirely to the precipitin and its associated serum protein, so that it is possible to collect fairly quantitative data concerning the composition of the precipitates.

From a study of a large number of experiments of this type, in which the amounts of antigen and antibody used were varied widely, the authors conclude that the precipitin reaction is chemical and may be represented by a series of simple chemical equations. The addition of antigen, S, to antibody, A, is said to result in the formation of a simple compound, AS, which is insoluble and therefore precipitates. This precipitate is capable of combining with more antigen to form another compound, AS_2, which is slightly more soluble than AS and which dissociates in solution into its component parts, in accordance with the chemical law of mass action. This dissociation of a slightly soluble compound might help to explain earlier observations on the coexistence of precipitin and antigen in the same solution, without the occurrence of mutual precipitation. Finally, the precipitate AS_2 dissolves in a large excess of antigen to form the soluble compound AS_3, which explains the "inhibition zone" encountered when a concentrated solution of antigen is added to its specific antiserum. This interpretation of the experimental facts seems entirely justified, as does the conclusion of the authors that, "looked at in this light, the phenomenon of specific immune precipitation becomes no more—and no less—mysterious than the specificity of silver ion for cyanide ion, or of barium ion for sulphate ion, and must ultimately be traceable to the same underlying causes."

In spite of the excellence of this work, other lines of evidence lead us to question whether the mechanism involved in the precipitin reaction is generally as simple as indicated. Recent investigation on the nature of antigens has shown that simple compounds, which by themselves do not lead to the formation of antibodies, may, when combined with protein, yield antiserums that are specific for the compound used irrespective of the type of protein with which it is combined. Such compounds, with certain exceptions, do not form precipitates when mixed with specific antiserum. They seem, however, to react with such antiserums since the resulting mixtures no longer precipitate the complex antigen originally used in the preparation of the antiserum. Experiments of this type suggest that antibody ordinarily reacts with simple substances, called haptenes by Landsteiner, to form soluble compounds and that, in those cases in which the haptene is part of a colloidal complex, precipitation occurs. The only known cases, thus far, of haptenes which form precipitates with antiserums are the very carbohydrates used by Heidelberger and Kendall, which are themselves colloidal polysaccharides. It would seem, therefore, that the conclusions reached by the authors are valid only for the

7. Norris, E. H.: The Early Morphogenesis of the Human Thyroid Gland, Am. J. Anat. **24**: 443 (Nov.) 1918.
8. Heidelberger, M., and Kendall, F. E.: A Quantitative Study of the Precipitin Reaction Between Type III Pneumococcus Polysaccharide and Purified Homologous Antibody, J. Exper. Med. **50**: 809 (Dec.) 1929.

particular system studied, in which precipitation takes place between the antiserum and a colloidal haptene.

In general, it seems reasonable to conclude that the precipitin reaction takes place in two stages. In the first stage there is a reaction between antigen and antibody which is specific and which may well be due to some simple chemical union between the antibody and the reactive part of the antigen. In the case of the simple haptene, the reaction stops at this point and precipitation does not occur. When, however, the antigen is colloidal in nature, by virtue of the first specific reaction between the antibody and the reactive part of the antigen a second reaction occurs, as yet somewhat obscure, which results in a modification of the colloidal properties of the complex and leads to the formation of the antigen-antibody precipitate.

Current Comment

THE COFFEY-HUMBER CANCER TREATMENT

Many letters and telegrams sent to the headquarters office of the American Medical Association indicate that the publicity, given through Hearst newspapers primarily, to the Coffey-Humber cancer treatment has brought about the very type of injury to scientific research that the editorial comment in THE JOURNAL, February 1, predicted would ensue. Regardless of the fact that Drs. Coffey and Humber have stated in their communication to THE JOURNAL and in letters sent to patients that their work is purely experimental; that they do not claim to have developed a cancer cure in the popular sense of that word; that they have no evidence that their preparation is anything more than a substance which produces lytic changes in cancer cells following injection, the great trek of cancer sufferers across the continent has begun and physicians everywhere are besought by their patients to procure this remedy. As THE JOURNAL has pointed out, various substances have been developed in the past that will produce lytic changes in cancer cells. At present, Hanson of Minnesota has developed a similar extract from the thymus of the calf, and Charlton reports that extracts of reticulo-endothelial tissue will produce the same response. Under these circumstances it is nothing less than criminal for newspapers to arouse the hopes of cancer sufferers and to cause the families of such sufferers to expend the limit of their funds to make the journey to California. No doubt future reports by Drs. Coffey and Humber will emphasize still further this point of view. The medical profession will do well to bear in mind constantly the criteria formulated by Geschickter [1] for judging cancer cures: "We all know what we want or wish for any patient suffering from this disease. First, we want to face the facts and know for certain whether or not the patient actually has cancer. This implies biopsy. Secondly, we want to be able to cure cases in all stages, even in the face of recurrences and generalized metastases. Thirdly, we want the cure to be permanent. These three criteria, histologic diagnosis, cure of metastatic cases and permanent cures established by follow-up examinations, extending over five year periods, should be applied to all alleged cancer cures."

1. Geschickter, C. F.: Recent Work on Cancer, J. A. M. A. **94**: 326 (Feb. 1) 1930.

THE PORTER ANTINARCOTIC BILLS

In THE JOURNAL, February 8, the leading editorial concerned the Porter antinarcotic bills and called on the medical profession to oppose this legislation for numerous reasons. February 14, Congressman Porter caused to be published in the *Congressional Record*, and issued to the Hearst newspapers, and apparently to these newspapers alone, a reply to this editorial. The reply was received in the headquarters office of the American Medical Association, February 17. The wide publication it has already had makes unnecessary a repetition in our columns. It offers nothing new in evidence or argument to cause any change in the point of view expressed in our original editorial. THE JOURNAL still feels that all the power the medical profession can wield must be mustered to the defense of the right of physicians to practice medicine without further bureaucratic molestation.

AN OUTBREAK OF TRICHINOSIS IN CALIFORNIA

Much research dealing with *Trichinella spiralis* has been done by the United States Department of Agriculture. Ransom and his co-workers [1] pointed out several years ago that refrigeration at 5 F. for not less than twenty days kills the worm and gives a margin of safety; that temperatures of from 137 to 140 F. will kill the parasite if the meat actually reaches this temperature throughout, and that salt, drying, refrigeration, smoking and heating technically combined in certain ways will kill trichinae and render the meat safe. This work has been amply confirmed, and these so-called devitalized processes can be used in handling pork products that are intended for human consumption with little or no cooking. Moreover, many public health agencies have stressed the danger of eating raw pork that has not been properly treated or that has been prepared in the home and insufficiently cooked. The careful meat packer cannot be blamed, but unfortunately the sale of all pork is affected when an outbreak occurs. The responsibility of prevention rests primarily on the health officials and secondarily on the general public. This point of view is emphasized when it is remembered that swine can come to slaughter with unrecognized disease, that macroscopic meat inspection is of doubtful certainty, and that microscopic inspection is unsatisfactory and generally considered unpractical. With all safeguards trichinosis continues to occur. January 11, the California Department of Public Health [2] reported twenty-five cases of trichinosis, and the number has since been increased to eighty-four

1. Ransom, B. H.: Effects of Refrigeration on the Larvae of Trichinella Spiralis, J. Agric. Res. **5**: 819, 1915-1916. Ransom, B. H., and Schwartz, B.: Effects of Heat on Trichinae, ibid. **17**: 201, 1919. Ransom, B. H.: Bull. 880, U. S. Dept. Agric., 1920.

2. Bulletin, California State Dept. of Pub. Health, Jan. 11, 1930.

cases, the majority appearing in San Francisco, Alameda and Oakland. Cases occurring in limited areas usually have some common source. The disease frequently offers clinical difficulties as to diagnosis and treatment. Continuous fever, diarrhea, and pains in the joints and the muscles, especially in foreign born residents, should be looked on with suspicion. Aikman [3] pointed out that the disease cannot be ruled out by a low eosinophil count and that diagnosis may be cleared up by spinal puncture and examination of centrifugated spinal fluid. Presumably the disease occurs with sufficient frequency to cause meat packers to include in their educational propaganda the need of avoiding all but well cooked pork. Finally, health officials must be diligent in scrutinizing methods of local pork slaughtering not under federal supervision, remembering that the rat is probably with swine an equal reservoir of the infection. In addition, there is need of research in developing some form of specific therapy.

THE HAZARD OF USING NONACCEPTED DRUGS

Recently the American Medical Association Chemical Laboratory published a report on Bichloridol collapsules [4] indicating that only from one tenth to one fifth of the amount of mercuric chloride claimed to be present was actually discovered. Elsewhere in this issue appears a letter by Dr. R. N. Harger confirming the results of the A. M. A. Chemical Laboratory. Apparently most of the mercuric chloride had reacted with the lining of the collapsule and was not in the medicament itself. This product has been administered to patients by physicians who thought they were giving a certain dosage of mercuric chloride, whereas, from the various analyses, it appears that the patient received only from one tenth to one fifth of the therapeutic dose he should have had. In 1925, the Council declared Bichloridol nonacceptable for New and Nonofficial Remedies because it was marketed with indefinite statements of composition under a nondescriptive proprietary name. It is safer to follow the Council!

RELATION OF ALLERGY TO IMMUNITY IN TUBERCULOSIS

Immunology has been characterized by numerous paradoxes and incongruities; for example, fatal anaphylaxis in diphtheria-immune guinea-pigs on the injection of a fraction of the normal lethal dose of diphtheria toxin. In no field of immunology have inconsistencies been more numerous than in tuberculosis, a field recently reviewed by Dr. A. R. Rich [5] before the Philadelphia Pathological Society. Among the inconsistencies mentioned are animals thrown into anaphylactic shock on intravenous injection with tuberculoproteins but showing no local skin reactions; necrotizing skin hypersusceptibility without suggestion of systemic anaphylaxis; cutaneous hypersensitiveness coexisting with tuberculo-immunity, and adequate immunity with apparently normal skin. Paradoxes of this type have forced immunologists to the humiliating conclusion that there must be something radically wrong in the historic basic concepts of their science. According to classic immunology, "antibodies" are purposeful defensive internal secretions, chemically identical in all organs and tissues of the body and of constant chemical composition with a given antigen, regardless of time, dosage, portal of entry or topographic distribution. Intracellular "antibodies" chemically distinct from circulating "antibodies" are inconceivable. Relatively unstable, immature "antibodies" or "antibody precursors" cannot be postulated. Physiologically harmful variants of a defensive hormone are paradoxic. To the newer immunology,[6] however, which pictures many of the so-called antibodies as primary, secondary and even tertiary products of biochemical interaction between injected antigens and tissue proteins, intracellular "antibodies" and humoral "antibodies" are not necessarily identical, nor are all precursors and variants of the same "antibody" of the same stability and physiologic function. In seeming confirmation of the newer concepts, Dr. Rich voices his personal conviction from his accumulated data that in tuberculosis at least there is no *necessary* relationship between hypersensitivity and immunity. "In the present state of information in regard to tuberculosis it is wiser not to interchange too glibly the terms 'allergy' and 'resistance' or to use the current evasive phrase 'allergy is an index of resistance.'"

3. Aikman, John: Trichinosis in Children, New York State J. Med. **26**: 20 (Jan.) 1926.
4. THE JOURNAL, Dec. 21, 1929, page 1971.
5. Rich, A. R.: The Rôle of Allergy in Tuberculosis, Arch. Int. Med. **43**: 691 (May) 1929.

Association News

MEDICAL BROADCAST FOR THE WEEK

Morning Health Talks from Hygeia

The American Medical Association, through its Bureau of Health and Public Instruction, broadcasts daily at 10 o'clock, Central Standard Time, with the exception of Friday, when the health message is delivered at 9:45, over Station WBBM (770 kilocycles, or 389.4 meters).

The program for the week of February 24 to March 1 is as follows:

February 24. The Deadly Amanita.
February 25. What Do We Measure by the Intelligence Test?
February 26. Why Is a Child Always Hungry?
February 27. Fooling the Fat.
February 28. Baby Has a Tooth.
March 1. Flies.

Health Talks During Noon Hour

The American Medical Association broadcasts daily at 12:20 to 12:25 over the following stations of the Columbia Broadcasting System: WBBM, Chicago; WFBM, Indianapolis; WCCO, Minneapolis; KOIL, Council Bluffs, Iowa; KMOX, St. Louis; WIBW, Topeka, Kan.; KFH, Wichita, Kan., and WMT, Waterloo, Iowa.

The subjects that will be presented for the week of February 24 to March 1 are as follows:

February 24. Samoan Medicine.
February 25. Freckles That Fussy Folks Fear.
February 26. The Doctor Puts Health on the Air.
February 27. Plucking the Beam from Our Eyes.
February 28. Underestimating the Danger of Measles.
March 1. Vaccinate Against What?

6. Manwaring, W. H.: The Newer Knowledge of Bacteriology and Immunology, University of Chicago Press, 1928, p. 1098.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Dr. Durrett Appointed State Health Officer.—Dr. James J. Durrett, chief of drug control, Food, Drug and Insecticide Administration of the U. S. Department of Agriculture, has been elected state health officer of Alabama by the state committee of public health. Dr. Durrett was health officer of Tuscaloosa County from 1915 to 1917, was in the United States Public Health Service from 1917 to 1920, and was health officer of Memphis and professor of public health in the University of Tennessee from 1920 to 1927. He will assume his new duties about April 1.

CALIFORNIA

University News.—The University of California has received an anonymous gift of $100,000 for the support of research in cancer and allied subjects by the medical school and the Hooper Foundation for Medical Research; this sum provides a total endowment of $200,000 for research in this field. Mr. and Mrs. George H. Roos, San Francisco, who recently made a gift of $100,000 for research in thoracic surgery and cancer, lately added $5,000 for the equipment of a clinic and research laboratory to carry on this work.

Much Less Communicable Disease.—There were 38,000 fewer cases of communicable disease reported in California in 1929 than were reported during 1928, according to the *Weekly Bulletin* of the California Department of Public Health. The number of cases for 1929 was 106,851 and for 1928 was 144,972. Marked declines were noted in 1929 in the prevalence of diphtheria, influenza and typhoid, and increases were noted for scarlet fever, smallpox, mumps and bacillary dysentery. The decline in diphtheria from 4,741 cases in 1928 to 3,008 in 1929 is regarded as of considerable significance.

Medical Library Established.—The establishment of a medical library has been made possible by the University of Southern California Medical School through the recent acquisition of the professional library of the late Dr. C. Francis S. Tate and the large book collection of the late Dr. Charles W. Bryson. The library will be opened within a few weeks, making available between four and five thousand volumes for reference. The custodian will be Miss Marguerite Campbell, formerly librarian of the Peiping Union Medical College, Peiping, China, and of the Boston Medical Library.

Plans for Preschool Health Campaign.—The bureau of child hygiene of the state department of public health is organizing its annual campaign for the physical examination of children who will enter school for the first time next fall, and is cooperating with the California Congress of Parents and Teachers. The campaign will be state-wide. In the last two years nearly 30,000 California children have received these examinations before entrance into public schools. It is anticipated that at least 25,000 children of preschool age will receive examinations in this campaign, which will be given without charge to the parents.

COLORADO

Society News.—Dr. William A. Osborne, professor of physiology and dean of the University of Melbourne School of Medicine, Melbourne, Australia, addressed the faculty of the University of Colorado School of Medicine and members of the Denver Medical Society, January 20, on "Application of Recent Advances in Physiology to the Practice of Surgery."——The annual clinics of the University of Colorado School of Medicine and Hospitals will be held March 26-28; they will include the various specialties, but particular emphasis will be placed on diagnostic methods of interest to general practitioners.

CONNECTICUT

Society News.—Dr. Willard C. Rappleye, New Haven, director of study of the Commission on Medical Education, gave the fourth annual Stanford E. Chaille memorial address at Tulane University School of Medicine, New Orleans, recently, on "The Doctor and the Public."

Personal.—Dr. J. G. Dusser de Barenne has been appointed professor of physiology at Yale University School of Medicine. Since 1919 Dr. Dusser de Barenne has been a neurologist at the St. Antonius Hospital, Utrecht, and professor of physiology in the University of Utrecht; he will commence work at Yale next autumn.

Hospital News.—The Raleigh Fitkin Memorial Pavilion at the New Haven Hospital was dedicated, February 9. The pavalion was the gift of Abram E. Fitkin, New York, who gave $600,000 for the construction of the building and $500,000 to establish an endowment for the work in children's diseases (THE JOURNAL, March 2, 1929, p. 728).

Mental Hygiene Lectures.—The Bridgeport County Medical Society is sponsoring a series of five lectures, the first of which was given, January 20, by Dr. Abraham Myerson, professor of neurology and neurologic pathology, Tufts College Medical School, on "Inheritance and Environment"; Dr. Esther Loring Richards of Johns Hopkins Hospital, Baltimore, discussed "Nerves: Their Meaning in Our Lives," February 3. William H. Kilpatrick, Ph.D., of Teachers' College, Columbia University, New York, gave the third lecture, February 17, on "Education for Character"; Mrs. Sidonie M. Gruenberg, director, Child Study Association of America, will speak, March 3, on "The Parent Faces a New World"; the concluding lecture will be given by Dr. James S. Plant, director, Essex County Juvenile Clinic, Newark, N. J., March 17, on "The Purpose of Mental Hygiene."

DISTRICT OF COLUMBIA

Personal.—Dr. Charles Armstrong, bacteriologist of the U. S. Public Health Service, who has been directing the fight against psittacosis, recently entered the naval hospital for tests to determine definitely whether he has contracted the strange disease. Dr. Armstrong became ill following the death of Harry B. Anderson, an attendant at the Hygienic Laboratory, Washington, D. C., where he handled the parrots with psittacosis.

Society News.—The Medical Society of the District of Columbia held a joint meeting with the Baltimore City Medical Society, February 19, and was addressed by Drs. William S. Baer, Baltimore, on "Treatment of Osteomyelitis by Means of Maggots," illustrated, and J. M. T. Finney, Baltimore, "Tumors of the Breast." Dr. Warren H. Lewis, Baltimore, presented a moving picture of the normal and tumor cells.

FLORIDA

Personal.—Dr. Vernon A. Lockwood, formerly of Mansfield, Ohio, has been appointed chief surgeon of the East Coast Hospital, St. Augustine, and of the East Coast Railway.——Dr. Alva C. Hamblin, Tampa, has been added to the bureau of communicable diseases of the state board of health and has been detailed to work in Gadsden County on hookworm and malaria control.

ILLINOIS

Abortionist Denied Parole.—George E. Fosberg, abortionist, was denied a release in October, 1929, by the board of parole. His case passed to the maximum term, which will expire July 30, 1932 (THE JOURNAL, Oct. 20, 1928, p. 1198).

Sentenced for Narcotic Violation.—Dr. Elmer L. Apple, Albion, is reported to have been sentenced to serve six months in jail at Murphysboro and fined $2,000 in federal court at East St. Louis, January 31, on a charge of violating the Harrison Narcotic Act.

Chicago

Personal.—Clarence W. Muehlberger, Ph.D., has been appointed professor of toxicology and pharmacology at Northwestern University and assistant director of Chicago's new scientific laboratory for the detection of crime affiliated with Northwestern University. He has recently been the state toxicologist of Wisconsin and professor of toxicology in the state university at Madison.——The Willard Gibbs medal of the Chicago section of the American Chemical Society has been awarded to Irving Langmuir, Ph.D., associate director of the General Electric Company research department, Schenectady, N. Y. Dr. Langmuir received the medal "for fundamental work on atomic hydrogen and on surface relations and also on electric discharge phenomena" and for "his contributions of great importance to nearly all branches of physical chemistry."——Dr. George Dick has resigned as chief of the department of medicine at the Evanston Hospital and will be succeeded by Dr. James G. Carr, Jr., professor of medicine at Northwestern University.

Dr. Katz Appointed Physiologist Under Wedeles Fund.—Dr. Louis N. Katz, assistant professor of physiology, Western Reserve University School of Medicine, has been appointed

physiologist and director of cardiovascular research at Michael Reese Hospital. The cardiovascular group of the clinical staff will concern itself at first mainly with problems having to do with angina pectoris and coronary artery disease, but other studies will also be made. Dr. Katz will assume his new duties about April 1.

Society News.—The Chicago Council of Medical Women will be addressed, March 7, at the Medical and Dental Arts Club, by Drs. Lucile R. Grant and Ruth Tunnicliff on "Pollen Disease (Hay-Fever) in the Chicago District" and "Measles," respectively.——The Bacteriology Club of the University of Chicago was addressed, February 13, by Walter J. Nungester, Sc.D., Northwestern University Medical School, on "Summary of Work on Dissociation of the Anthrax Bacillus."—— Dr. Daniel T. Quigley, Omaha, addressed the Chicago Roentgen Society, February 13, on "How Shall Modern Science Orient Cancer?"

INDIANA

Personal.—Dr. Arthur T. Kemper, it is reported, has presented his father's medical library, consisting of several hundred volumes, to the Ball Memorial Hospital, Muncie, as a nucleus for a scientific library.——Dr. Samuel E. Earp has given his collection of nearly 300 important scientific volumes to the library of the University of Indiana School of Medicine, Indianapolis.—— Dr. Charles F. Diefendorf, Evansville, has been appointed health commissioner of Vanderburgh County. ——Dr. Frank T. Dowd has been appointed police surgeon of Indianapolis.

Society News.—The Indianapolis Medical Society held a symposium on the recent epidemic of spinal meningitis, February 4; the speakers were Drs. Herman G. Morgan, Larue D. Carter, Edwin Rogers Smith and Lawrence H. Gilman. The society held a clinical meeting, February 11, at the Auditorium of the Indiana University School of Medicine; at the February 18 meeting Drs. Norman M. Beatty and Henry S. Leonard spoke on "Recklinghausen's Disease" and "Postoperative Embolism," respectively. Dr. Roy Wesley Scott, Cleveland, will address the society, February 25, on "Facts on the Heart: Clinical-Pathologic Observations on a Thousand Autopsied Cases."——The Tippecanoe County Medical Society entertained the local dentists at its meeting at Lafayette, recently; J. D. O'Meara, Fort Wayne, addressed the group on "The Relation of the Physician and Dentist." The society was addressed, February 13, by Byron E. Pontius, Ph.D., of Purdue University, on "Some Applications of the Laws of Heredity to Man."—Dr. Walter C. Van Nuys, Newcastle, addressed a joint meeting of the Delaware County Medical Society and Phi Delta Kappa, national educational fraternity, January 14, on "Epilepsy," and presented several cases from the Newcastle sanatorium.

KANSAS

Licenses Revoked.—At a meeting of the state board of medical registration and examination, Dec. 10, 1929, the license to practice medicine of Dr. Frank Gross (Grosshauser) was revoked on the ground of having obtained his Kansas license by fraud, misrepresentation and perjury. The board revoked the license of Dr. Ernest L. W. Brown at the same meeting on the ground of gross immorality.

Society News.—The Golden Belt Medical Society was addressed in Junction City, January 2, by Dr. William C. Menninger, Topeka, on "Epilepsy of Congenital Syphilitic Origin"; Dr. Bertram A. Poorman, Kansas City, Mo., "Gallbladder Surgery"; Dr. Victor E. Chesky, Halstead, "Carcinoma of the Large Intestine," and Dr. Richard C. Lowman, Kansas City, "Goiter."——The Central Kansas Medical Society was addressed at Ellsworth, January 10, among others, by Dr. Henry St. Clair O'Donnell on "Some Impressions of My Work in Vienna."

KENTUCKY

Bills Introduced.—S. 204 and H. 274 seek to amend the workmen's compensation law, among other ways, (1) by extending to 120 days the time for which the employer shall be liable for medical, surgical and hospital services rendered an injured employee, and (2) by providing that the compensation board may in its discretion allow medical and hospital services in an amount not to exceed $200 more than is now allowed by law. S. 214 proposes to regulate the practice of barbering. S. 250 proposes to declare void the marriages of idiots or lunatics. H. 240 proposes to provide for the sexual sterilization of insane or feebleminded inmates of state institutions. H. 264 proposes that all appointments of members of the state board of health be made from lists of three names for each vacancy, the list in each case being furnished by the state society or association of such schools or systems of practice as are entitled to the member "as shown by their greater numerical strength in membership of like societies or associations." The present law provides for the appointment of homeopathic, eclectic and osteopathic members, one each, one pharmacist, and four "allopathic physicians," from lists of three names for each vacancy, the list to be furnished in each case "by the state society or association of such schools or systems of practice as are entitled to the member." H. 301 proposes to regulate the sale and distribution of dangerous caustic or corrosive substances by providing for the labeling of the same.

MARYLAND

Hospital News.—A memorial clinic for sufferers of ear, nose and throat troubles was opened, January 25, at the University of Maryland Hospital, in memory of the 2 year old daughter of Dr. Edward A. Looper, Baltimore, who died last year——According to a report of Dr. Winford H. Smith, director, Johns Hopkins Hospital, 43 per cent of the public and private patients admitted to the hospital during the past fiscal year were treated without cost, while another 5 per cent were placed under this classification after admission to the hospital.

Society News.—The Baltimore City Medical Society was addressed, February 7, by Dr. Henry J. Walton on "Use of the Roentgen Ray in Obstetrics"; Dr. Frederick B. Smith, "Narcolepsy with Thyroid Deficiency, Probably Following Encephalitis"; Dr. Edwards A. Park, "So-Called Epituberculosis as Experienced in the Child," and Dr. Robert H. Riley, director, state department of health, "Psittacosis in Maryland."——Dr. Charles W. Whaland, Chestertown, was elected president of the Kent County Medical Society at its reorganization meeting, January 26. Dr. Whaland, who recently celebrated his eighty-first birthday, was nominated to the presidency of the society twenty-five years ago, which was the last meeting held by the society.—— Dr. Peter K. Olitsky, New York, addressed the School of Hygiene and Public Health, Johns Hopkins University, February 18, on "Studies on the Bacteriology of Epidemic Influenza."

Mental Hygiene Conference.—The Mental Hygiene Society of Maryland will conduct a mental hygiene conference, March 6-7, at the Medical and Chirurgical Faculty Building, 1211 Cathedral Street, Baltimore. There will be six sessions, at which the topics for discussion will be the home, mental hygiene factors in the educational field, social work, delinquency and crime, and the feebleminded situation. The tentative program includes: "The Significance of the Parent-Child Relationship," Mrs. Sidonie M. Gruenberg, director, Child Study Association of America; "Problems of the Home in Relation to the Child's School Situation," Dr. Esther L. Richards, associate professor of psychiatry, Johns Hopkins University School of Medicine; "Problems Which the Child Develops in the School Situation," Alice J. Rockwell, Ph.D., clinical assistant in psychology, Mental Hygiene Clinic, University Hospital; "Problems of High School and College Students," Dr. Edgar Van Norman Emery, Yale University, New Haven, Conn.; "Functional Relationship of the Clinic and Agency," Miss Elizabeth Healy, All-Philadelphia Child Guidance Clinic, Philadelphia; "The Individual and the Community," Leon C. Marshall, LL.D., Law Institute, Johns Hopkins University; "The Problem Child," Dr. Ralph P. Truitt, director, Mental Hygiene Clinic, University Hospital, Baltimore; "The Juvenile Delinquent," Dr. Carrie W. Smith," Reisterstown, Md.; "The Criminal," Dr. Walter N. Thayer, Jr., superintendent of prisons, state department of public welfare; "The Schools' Responsibility," J. E. W. Wallin, Ph.D., director of special education, Baltimore Public Schools; "The Social Agency's Responsibility," Mr. Paul T. Boisser, executive secretary, the Henry Watson Children's Aid Society, Baltimore; "The State's Responsibility," Stanley P. Davies, Ph.D.; "The Individual Versus His Organ Systems" and "Mental Disorders as a Public Health Problem," speakers to be announced later.

MINNESOTA

Personal.—Jesse F. McClendon, Ph.D., professor of physiology, University of Minnesota Medical School, Minneapolis, has contributed medical books valued at more than $1,000 to a student library at the university.

Society News.—The Hennepin County Tuberculosis Association held its twenty-seventh annual meeting in Minneapolis, January 30; the general topic for discussion was "How Our Community Is Meeting Its Tuberculosis Problem."—— The Minnesota Academy of Medicine was addressed, February

19, at Minneapolis, on "A Plea for the Radical Treatment of Incomplete Abortion" by Dr. Albert G. Schulze, St. Paul, and "The Larynx as Related to Surgery of the Thyroid Based on an Anatomic Study" by Dr. Martin Nordland, Minneapolis. Dr. Alexander R. Hall, St. Paul, presented a case report on "Abnormal Subclavian Arteries."

MISSISSIPPI

Bill Introduced.—S. 95 proposes to provide compensation for employees for disability or death resulting from injury arising out of and in the course of employment, and to allow the employer to select the physician to treat the injured employee.

NEBRASKA

Society News.—Of the 1,800 physicians in the state, 1,200 are members of the state medical society.——The Richardson County Medical Society was addressed, recently, at Falls City, by Dr. Millard L. Wilson on "Angina Pectoris"; Dr. Edward R. Hayes, "Eczema," and Dr. Oscar F. Lang, "Surgical Problems of the Chest."——Dr. Townsend E. Dent, Omaha, addressed the Lincoln County Medical Society, January 9, at North Platte, on "Local Anesthesia in the Reduction of Fractures."

NEW JERSEY

Graduate Courses for the County Societies.—Two graduate courses will be held in April and May under the joint auspices of the Medical Society of New Jersey and the University Extension Division of Rutgers University. The courses, one in general medicine and one in traumatic surgery, will be available to any county medical society which arranges to organize classes in one or both subjects with a minimum group of twenty-five members for each course. There will be eight lectures on each subject. The registration fee is $30 per person.

Society News.—Among others, the Camden County Medical Society was addressed, February 11, by Dr. Joseph C. Lovett on "Diphtheria of the External Auditory Canal," and Dr. Hyman Goldstein, "Hypocalcemia with Lowered Basal Metabolism and Bleeding Tendency."——The Hunterdon County Medical Society was addressed, January 21, at Frenchtown by Dr. Frank G. Scammell, Trenton, on "Increasing Frequency with Which Myringotomy Is Being Performed in Our Hospitals."——Dr. Collier F. Martin, Philadelphia, addressed the Atlantic County Medical Society, February 14, on "Diagnosis of Anorectal Diseases"; demonstration of rectal infection with moving pictures.

NEW YORK

Bills Introduced.—S. 625 and H. 972 propose to create a board of chiropractic examiners and to regulate the practice of chiropractic. The practice of chiropractic is defined as the "diagnosis, the locating and adjusting by hand of the vertebral column and tissues. This shall not include the use of operative surgery or obstetrics or the administering or prescribing of drugs or medicine included in the pharmacopeia or materia medica." H. 573 proposes to provide that, on the refusal or neglect of the employer to provide an injured employee with medical treatment, the physician attending the injured employee, in order to recover from the employer, need report such treatment to the employer only on demand of the employer. H. 738 and H. 831 propose to amend the workmen's compensation law by permitting the injured employee to choose his own physician. H. 830 proposes to amend the workmen's compensation law by classifying as compensable occupational diseases any and all disabling diseases and disabling illnesses contracted in any and all employments coming within the law. H. 835 proposes to create in the education department a division of medicinal liquor to carry out the provisions of the proposed law relating to the prescribing, sale and use of intoxicating liquors for medicinal purposes. H. 855 proposes to provide that all cosmetics sold in the state be labeled to show that the cosmetic is noninjurious, the name of compounder and date of compounding, and to require the manufacturers of cosmetics to file the formulas with the state public health department.

New York City

Hospital News.—The new Madison Park Hospital, Avenue O and East Twenty-Sixth Street, Brooklyn, was recently opened.——The members of the Goshen Emergency Hospital Association recently changed its name to the Goshen Hospital, Goshen.

University News.—Plans have been filed for two buildings designed to house 1,000 nurses and employees of the new medical center of the New York Hospital-Cornell Medical College Association, and for all the service and power facilities of the center.

Hospital-Hotel Opened.—The Doctors' Hospital, a new $4,250,000 private institution overlooking the East River on Eighty-Seventh Street, was opened, February 9. Every effort was made to eliminate the hospital atmosphere and to surround the patient with the comfort of a home. It is a fourteen story brick structure with two basements, and contains 264 private rooms; it has no wards. Every floor has kitchen facilities, and a private icebox for each patient. One hundred and eighty-two physicians and surgeons make up the medical board (THE JOURNAL, May 18, 1929, p. 1687).

Research on Tooth Decay at Columbia.—A three year research program was started, February 1, under the direction of the Columbia School of Dental and Oral Surgery, seeking to discover factors which make pyorrhea or tooth decay prevalent. A grant for this undertaking has been received from the Commonwealth Fund whereby $35,600 has been donated for each of three years. The Columbia workers will cooperate with a group at Yale engaged in a similar project (THE JOURNAL, June 29, 1929, p. 2176), under a grant from the Rockefeller Foundation, and also with other research workers in this country and Europe.

Health Inventory Completed.—This report, which has been under way for more than two years by the research bureau of the Welfare Council, has been completed. It is a 400 page volume, analyzing the work of 300 or more health organizations of the city. It reveals that New Yorkers pay for the prevention of disease only one eighteenth as much as they spend for its cure and care each year. The typhoid death rate for New York City was shown to have decreased in fifty years from 28 per hundred thousand of population to little more than 1 per hundred thousand. In the last thirty years the infant death rate was reduced from 170 per thousand births to little less than 60 per thousand.

NORTH CAROLINA

Society News.—The Raleigh Academy of Medicine was addressed at its sixtieth annual meeting, February 1, by Dr. Walter A. Baetjer, Baltimore, on arthritis; Dr. John B. Wright, Raleigh, was elected president.——The superintendent of the state hospital at Goldsboro reported, January 10, that 156 deaths occurred at the institution in the past six months, and that fifty-nine of them were due to pellagra.

NORTH DAKOTA

Society News.—The North Dakota Academy of Ophthalmology and Oto-Laryngology held its midyear meeting at Fargo, January 11. Among others, Dr. William R. Winn, Fargo, gave "A Biographical Sketch of Sir William Paget Bowman"; Dr. Gustaf A. Larson discussed "Observations on the Pathology and Diagnosis in Chronic Maxillary Sinus Disease," and Dr. Horace Newhart, Minneapolis, spoke on "Hearing Problems and the Use of the Audiometer."

OHIO

Personal.—Dr. Charles A. Doan of the Rockefeller Institute for Medical Research, New York, has been appointed chairman of the new department of medical and surgical research which is being established in the Ohio State University College of Medicine, it is reported, effective July 1.——Dr. Earl R. Bush, Cincinnati, has resigned as regional medical officer of the U. S. Veterans' Bureau to accept a position as associate medical director of the Western and Southern Life Insurance Company.

Society News.—Drs. Joseph W. Shaw, Coshocton, and Benjamin F. Cureton, Walhonding, will address the Coshocton County Medical Society, February 27, at Coshocton on cancer and strangulated hernia, respectively.——Dr. Philip D. Wilson, Boston, addressed the Toledo Academy of Medicine, February 7, on "Surgery of Arthritis."——Dr. Leslie L. Bigelow addressed the Columbus Academy of Medicine, January 27, on "The Cost of Medical Care."

History of Cleveland Medicine.—A history of the profession of medicine for the last century in Cleveland is incorporated in the first complete graduate catalogue of the school of medicine of Western Reserve University. It lists 7,260 persons who have received instruction from the institution, going back to 1843 when the Willoughby Medical College moved to Cleveland. In the course of its development, Western Reserve University has absorbed the medical schools of Wooster University, Ohio Wesleyan University and the Charity Hospital Medical College of Cleveland.

OKLAHOMA

Society News.—The Cleveland County Medical Society was addressed, January 16, at Norman by Dr. Charles A. Brake on "Observation of Post-Volstead Alcoholic Psychosis."——Dr. Ernest B. Dunlap spoke on "Inflammatory Diseases of the Tubes and Ovaries," January 14, before the Comanche County Medical Society, Lawton.——The Pottawatomie County Medical Society was addressed, January 18, by Dr. Edgar Eugene Rice, Shawnee, on "Treatment of Fractures," and by Dr. Claude A. Thompson, Muskogee, secretary, state medical association, on "Some Phases of Surgery—Fractures, Anesthesia."

PENNSYLVANIA

Personal.—Dr. Howard H. Drake, the only surviving member of the original staff of the Montgomery Hospital, Norristown, was guest of honor at its annual meeting, January 28. Dr. John Quincy Thomas, resident physician in 1898, Dr. Edgar S. Buyers, resident physician in 1902, and Dr. George W. Miller, Jr., resident in 1906, spoke on the history of the institution.——A bronze tablet in memory of Dr. Kay I. Sanes was unveiled at the Montefiore Hospital, Pittsburgh, January 13.

Philadelphia

University News.—The University of Pennsylvania has received $250,000 from Eldridge R. Johnson for the further endowment of the Eldridge R. Johnson Foundation for Research in Medical Physics, it has recently been announced. This gift increases the amount which Mr. Johnson has given to the university during the last ten years to nearly $2,000,000. The Johnson Foundation is housed in the recently completed Martin Maloney Memorial Medical Clinic Building of the University of Pennsylvania Hospital (THE JOURNAL, Nov. 10, 1928, p. 1471).

Personal.—Dr. John Rathbone Oliver, professor of the history of medicine, University of Maryland School of Medicine, Baltimore, and a member of the faculty of Johns Hopkins University, was the guest of the Philadelphia churches and clergy, February 9-10.——Representatives of the medical profession and pioneer suffragists attended a dinner at the Bellevue-Stratford Hotel, February 14, in honor of the eighty-third birthday of Dr. Anna Howard Shaw, champion of women's rights. Among the speakers were Dr. William Gerry Morgan, Washington, D. C., President-Elect of the American Medical Association; Secretary of Labor James J. Davis, and Mrs. Carrie Chapman Catt. Attention was directed to the new opportunities for service in the field of preventive medicine which will be afforded by the Anna Howard Shaw department of preventive medicine in the new college building now being erected at Falls of Schuylkill.——Dr. William J. Harrison has been awarded the Corinna Borden Keen Scholarship for one year for the purpose of pursuing graduate work in ophthalmology under Dr. Ignicio Barraquer, Barcelona, Spain.——Dr. William W. Keen celebrated his ninety-third birthday, January 20.

SOUTH CAROLINA

Bill Introduced.—H. TN. 12 proposes to create a board of barber examiners and to regulate the practice of barbering.

TENNESSEE

Society News.—The Nashville Academy of Medicine was addressed, February 4, by Dr. Emmett E. Brown on "Ringworm," and February 11, by Dr. Charles M. Hamilton on "Malignancies of the Oral Cavity."——Dr. Venable L. Lewis, Crossville, addressed the Four-County Medical Society, January 16, on influenza.——Dr. Nicholas S. Walker, Dyersburg, was elected president of the Tri-State Medical Association, January 15.

Health at Nashville.—Telegraphic reports to the U. S. Department of Commerce from sixty-four cities with a total population of 30 million, for the week ended February 1, indicate that the highest mortality rate (26.1) was for Nashville, and that the mortality rate for the group of cities as a whole was 14.3. The mortality rate for Nashville for the corresponding week of last year was 19.4, and for the group of cities, 16.7. The annual rate for sixty-four cities was 13.6 for the five weeks of 1930, as against a rate of 18.7 for the corresponding weeks of 1929. Caution should be used in the interpretation of these weekly figures, as they fluctuate widely. The fact that some cities are hospital centers for large areas outside the city limits or that they have a large negro population may tend to increase the death rate.

UTAH

Consulting Staff for Mental Hospital.—The state board of insanity voted, January 9, to invite the following physicians throughout the state to be members of the consultant staff for the state mental hospital at Provo:

Dr. Foster J. Curtis	Dr. William L. Rich
Dr. Alfred A. Robinson	Dr. Walter G. A. Schulte
Dr. George Gill Richards	Dr. James P. Kerby
Dr. Maurice M. Critchlow	Dr. Horace G. Merrill
Dr. Parley L. Holman	Dr. William P. Donoher
Dr. John W. Aird	Dr. Samuel C. Baldwin
Dr. Martin C. Lindem	Dr. Howard P. Kirtley
Dr. Joseph A. Phipps	Dr. Theodore B. Beatty

The consultants will serve without pay, except for services performed, and in most cases will act in an advisory capacity.

WISCONSIN

Personal.—Dr. Samuel Plahner, Milwaukee, has been appointed by the University of Wisconsin Extension Division to give a course in individual psychology during the second semester, 1929-1930.

Society News.—The Milwaukee Academy of Medicine was addressed, Dec. 10, 1929, by Dr. Norbert Enzer on "Krukenberg's Tumor," illustrated; Dr. Stanley J. Seeger gave an illustrated talk on "Cancer of the Rectum," and Dr. Chester M. Kurtz of the University of Wisconsin Medical School, Madison, spoke on "Recent Advances in the Diagnosis and Management of Heart Disease"; the academy was addressed, recently, by Dr. John L. Garvey, Milwaukee, on "Spinal Arthropathies of Tabetic Origin," and Dr. Bela Halpert, Chicago, "Functions of the Gallbladder and Some of Their Disturbances in the Light of Recent Investigations."——The Milwaukee Pediatric Society was addressed, Dec. 11, 1929, by Dr. Charles A. Aldrich, Winnetka, Ill., on "Nephritis in Children."——Prof. William A. Osborne, professor of physiology and dean of the medical faculty, University Medical School, Melbourne, Australia, addressed the University of Wisconsin Medical Society, January 17, on "Physiology in Surgery."——One hundred emergency calls were relayed to physicians by the Physicians' Service Bureau of the Milwaukee County Medical Society during December, 1929, it is reported. During the first thirty days of the bureau's existence, 4,000 incoming calls were recorded.——The Medical Society of Milwaukee County was addressed, February 14, by Dr. Elliott P. Joslin, Boston, on "Changes in Treatment of Diabetes."——Dr. Mynie G. Peterman, Milwaukee, addressed a joint meeting of the Milwaukee Pediatric Society and the Milwaukee Academy of Medicine, February 11, on "Congenital Heart Disease"; Dr. Arthur H. Parmelee, Chicago, "Some Problems of New-Born Infants," and Dr. William B. McClure, Evanston, Ill., "Respiratory Tracings in Various Conditions."

WYOMING

Personal.—Dr. Joseph L. Wicks, Evanston, was elected president of the Wyoming Health Officers' Association, January 6.——Dr. Alexander L. Darche, formerly of Chicago, who was recently appointed assistant superintendent of the Wyoming State Hospital, Evanston, is also state psychologist for Uinta County.

GENERAL

Graduate Course Open to American Physicians.—Prof. Georges Portmann will hold a graduate five week intensive course in ear, nose and throat surgery at the University of Bordeaux, France, beginning July 21, which will be open to American physicians. Information may be had from Dr. Leon Felderman, Mitten Building, 1407 Locust Street, Philadelphia.

Mortality from Automobile Accidents.—The U. S. Department of Commerce announced that during the four weeks ended January 25, seventy-eight large cities in the United States reported 655 deaths from automobile accidents, whereas 612 deaths were reported for the four weeks ended Jan. 26, 1929. For the fifty-two week periods ended January 25 and Jan. 26, 1929, the totals for the seventy-eight cities were, respectively, 8,446 and 7,597, which indicates a recent rate of 25.7 per hundred thousand of population as against an earlier rate of 23.1, or an increase of 11 per cent in the rate in a single year.

International Society for Crippled Children.—A three day annual meeting of the International Society for Crippled Children will convene at the Royal York Hotel, Toronto, March 17-19. Among others, addresses will be made by R. M. Little, chief, bureau of rehabilitation, Albany, N. Y., on "Correlation of Crippled Children's Movement with Vocational Rehabilitation Program," and Dr. William Edward Gallie,

Toronto, "Bridging the Gap"; Dr. Elliott G. Brackett, Boston, "The Professional Committee on International Relations." Hon. G. Howard Ferguson, premier of Canada, and Hon. Franklin D. Roosevelt, governor of New York, among others, will speak.

International Health Exhibition at Dresden.—The first international scientific exhibition to be held in Germany since the World War will be the International Hygiene Exhibition at Dresden next May. These exhibitions, which were started in 1911 to disseminate health education, were supported at that time by the governments of Germany and Saxony and the city of Dresden, and nine other governments took part in the first one. More than five million persons attended. The profits were to have been used to erect a permanent museum building, but the results of the war practically wiped out this fund. New Dresden later donated a site as well as funds, and the German government and the state government donated equal amounts. The new museum building covers 5 acres and conforms to the type of architecture for which the city is widely known. Some of the exhibits will cover the following subjects: heredity and eugenics, nutrition, health education, the child, food, industrial hygiene, physical training and housing. There will be exhibits of public health activities by German cities and states, and exhibits by the League of Nations and foreign countries. The object is to make available, generally, the newer knowledge on health.

Proposed Definition of Blindness.—Adoption of a general standard of blindness throughout the world is recommended in a report from the Health Organization of the League of Nations. The recommendation is included in a study of the welfare of the blind in twenty-six countries, and the object is to secure greater uniformity in the treatment of the blind for the comparison of statistics of blindness between various countries and to show more precisely the extent of the real administrative problem of the blind in various countries. For the purpose of the U. S. census, instructions to enumerators of 1920 were as follows: "Include as blind any person who cannot see well enough to read even with the aid of glasses. The test in the case of infants must be whether they can apparently distinguish forms and objects, and, in the case of older persons who are illiterate, whether they can presumably see well enough to read if they knew how to read. Do not include any person who is blind in one eye only." A conservative figure of 2,390,000 is quoted as a "probable underestimate" made in 1910. In those countries where a census of the blind cannot be obtained, the prevalence of blindness is frequently greater. The practicability of the adoption of a uniform definition is questioned also in the report, because a change of definition in countries in which public assistance is given to the blind as such would have one of two effects: It would either deprive some persons of the benefits which they are now receiving or it would involve the public in increased expenditure. But if the attempt were made, the first step would be to decide how many definitions are needed and for what purpose, as for census purposes, for educational purposes and for the purpose of adults in such matters as training and employment and financial assistance.

Medical Bills in Congress.—H. R. 9888, introduced by Representative Cooper, Ohio, proposes to provide that the United States shall cooperate with state and local authorities in the promotion of the welfare and hygiene of mothers and children and in the development of local health service. The bill was referred to the Committee on Interstate and Foreign Commerce. H. R. 8528, introduced by Representative LaGuardia, New York, proposes to provide hospitalization and compensation for American citizens of American birth who, while serving in flying status in the Lafayette Escadrille or Lafayette Flying Corps, received injuries of a permanent nature of more than 10 per cent degree in line of duty between April 6, 1917, and Nov. 11, 1918. H. R. 9755, introduced by Representative Griffin, New York, proposes to provide for a medal of honor and financial awards to government employees for distinguished work in science. H. R. 9799, introduced (by request) by Representative Christopherson, South Dakota, proposes to establish a laboratory for the study of the criminal, dependent and defective classes. H. R. 9801, introduced (by request) by Representative Johnson, South Dakota, proposes to amend the World War Veterans' Act to provide outpatient treatment for veterans suffering from disabilities not of service origin and to provide that an ex-service man who had, prior to Jan. 1, 1925, "diabetes insipidus, primary anemias, arteriosclerosis, diabetes mellitus, Hodgkin's disease, leukemia, polycythemia (erythrema), arthritis deformans, arthritis chronic, carcinoma, malignant tumors, cardiovascular renal diseases (including hypertension), cholecystitis (chronic), endocarditis (chronic), leprosy, myocarditis (chronic), nephritis (chronic), nephrolithiasis, chronic nontuberculous pulmonary disease," developing a 10 per cent degree of disability or more, the disability shall be presumed of service origin, or of service aggravation.

LATIN AMERICA

Society News.—The sixth Pan American Conference of Child Hygiene will be held at Lima, Peru, July 4-11, under the presidency of Dr. Sebastian Lorente.

Meningitis in Mexico.—It was reported, February 17, that the Mexican Department of Public Health had sent medical assistance to the state of Sonora, Mexico, to cope with an epidemic of cerebrospinal meningitis. A delegation of national university students, touring the country on an educational campaign, telegraphed the university authorities that ninety-four persons had died from the disease in the Campas district of Sonora in three days.

FOREIGN

Fourth Vienna Summer School.—Six seminars will be given at the University of Vienna, Austria, July 1-15, on education and psychology, kindergarten education and social welfare, the German language and literature, art, music and general culture. Each course will last six weeks. Further information may be had by addressing the Institute of International Education, 2 West Forty-Fifth Street, New York, or the Austro-American Institute of Education, Elisabethstrasse 9, Vienna 1, Austria.

The Chair of Medicine at Aberdeen.—Following the resignation of Prof. Ashley W. Mackintosh from the regius chair of medicine in the University of Aberdeen, a departure from the usual manner of filling the chair was made. Previously the professorship was a part-time appointment with an annual salary of £850. Henceforth a salary of £1,200 will be attached to the chair in view of the professor being expected to devote more time to teaching and to research. The appointee will become honorary physician to the Royal Infirmary of Aberdeen and, having charge of beds, will be enabled to associate research with clinical practice. The appointment is made by the crown on recommendation of the secretary of state of Scotland.

Society News.—A graduate course on diseases of the nervous system is announced by the National Hospital Medical School, Queen Square, to be held from February 3 to March 18. The general course will consist of thirty-two clinical lectures and demonstrations. There will be eight lectures on the anatomy and physiology of the nervous system, and twelve clinical demonstrations on methods of examination of the nervous system. Applications should be addressed to the secretary, Medical School, National Hospital, Queen Square, London, W. C. 1.——The American House of the Cité Universitaire, Paris, will be dedicated in April. The house is for the housing of American students at moderate prices (THE JOURNAL, June 16, 1928, p. 1960).——The second International Congress on Malaria will be held in Algiers, May 19-21. Delegates and physicians who wish to attend the congress are requested to register their names as soon as possible with Dr. Parrot, secretary general of the congress, Pasteur Institute, Algiers.——Prof. R. J. S. McDowall gave a series of lectures on the control of circulation at King's College, Strand, W.C., the last of which was on February 20.——The Second International Congress for Sex Research will be held in the House of the British Medical Association, Tavistock Square, London, August 3-9, under the presidency of Prof. F. A. E. Crew, The University, West Mains Road, Edinburgh, to whom persons interested should write.——The forty-first Congress of the Royal Sanitary Institute will be held at Margate, England, June 21-28. Persons desiring to attend the congress should address J. W. Dudley Robinson, secretary, 90 Buckingham Palace Road, London, S.W., England.——The fifth International Congress of Physical Therapy will be held in Liége, Belgium, September 14-18. The chief questions to be discussed will concern rheumatism and diseases of the central nervous system. Further information may be had by writing to Dr. DuBois-Trepagne, secretary general, 25, Rue Louvre, Liége.

CORRECTION

Treatment of Pernicious Anemia with Swine Stomach.—In the article by Dr. H. Milton Conner in THE JOURNAL, February 8, the sentence beginning on the last line of page 389 was printed "one of these patients has been fed mucous membrane in amounts of only half a pound a day." It should have read "one of these patients has been fed mucous membrane only in amounts of half a pound a day."

Foreign Letters

LONDON

(From Our Regular Correspondent)

Jan. 25, 1930.

Psittacosis, or Parrot Disease, in England

The recent occurrence of a number of fatal cases of psittacosis, or parrot disease, in England has attracted attention because of the rarity of the malady. At the Dreadnought Hospital, London, which is devoted to the treatment of sailors, hundreds of whom pass through it in the year, no case of psittacosis has been observed, though many sailors must come into contact with parrots. However, it is possible that cases have occurred in this country and have not been diagnosed, because the malady is unknown to the great majority of physicians. At the London Hospital four cases, of which one proved fatal (in a well known health officer), have been treated in the last two months. Clinically the disease resembles paratyphoid fever or pneumonia or the two combined. There have been cases which show that actual contact with a parrot is not necessary and the malady has been conveyed from one person to another. In one case, parrots were purchased in July and psittacosis was not conveyed from them for five months to the persons associated with them. In one case, reported in the *British Medical Journal* by the deputy health officer of the port of London, a ship's carpenter, aged 53, was admitted, December 9, to the Port of London Hospital of London, in a condition suggestive of typhoid. The vessel had left Buenos Aires, November 9. He became ill, November 20, and complained of shivering, sweating, diarrhea and cough. The temperature ranged in the neighborhood of 102 F. On admission he was almost comatose, with dry tongue and foul mouth. Bronchitic sounds were heard over the bases of the lungs. For the first three days the temperature was 103 in the evening. It then fell by lysis and became normal, December 15. Enemas every other day produced light, semiformed stools. There was left pleurisy from December 13 to December 16. Other symptoms were tremors of the hands and tongue. Recovery ensued. The patient bought two small parrots in Buenos Aires, which he kept in his cabin on a perch for a fortnight. Then one became sick and drowsy and was thrown overboard. The other had diarrhea a few days later, fell from its perch and was picked up dead. The patient's illness began four days later. A specimen of blood was reported negative for typhoid and paratyphoid bacilli and for *Bacterium psittacosis* and *Bacillus aertrycke*. At the time the ship was in Buenos Aires there were several outbreaks of psittacosis in Argentina. The fact that there were no other cases of illness on board and that the patient alone had any association with sick parrots strongly suggested infection from them, though this was not confirmed bacteriologically. In a letter to the *Lancet*, Dr. H. L. Tidy points out that while *Bacterium psittacosis* and *Bacillus aertrycke* are identical according to all known methods, there is a wide difference clinically between the two infections. Thomson described psittacosis as "an illness of the typhoid type complicated by unusual signs in the lungs." Vomiting is frequent and some diarrhea is common. Epidemics due to aertrycke infections show as constant cardinal features diarrhea, vomiting and abdominal pain. Pyrexia is variable and pulmonary complications are absent. Cases of psittacosis are nearly all sporadic and infection is direct from sick parrots. Aertrycke infections are nearly all epidemic and due to infection from food.

Illicit Drug Traffic

In THE JOURNAL, March 16, 1929, p. 909, attention was called to the extent of the illicit drug traffic in Europe. An institution recently established at Cairo, primarily for the benefit of Egypt, the Central Narcotics Intelligence Bureau, which is under the control of Major General T. W. Russell, commandant of the Cairo police, has shown the almost incredible magnitude of the traffic. While the countries suffering from the traffic think in grams and kilograms, the unit of calculation in the central European manufacturing countries when talking of narcotics is the metric ton. Russell investigated drug manufacturing in Europe and found that in Alsace the following were manufactured:

Heroin, 1926, 1,063 Kg.; 1927, 667 Kg.; 1928, 4,349 Kg.; 1929 to June, 335 Kg.—a total of 6,414 Kg.

Morphine, 1926, 165 Kg.; 1927, 150 Kg.; 1928, 477 Kg.; 1929, to June, 151 Kg.—a total of 943 Kg.

Cocaine, 1926 and 1927 nil; 1928, 205 Kg.; 1929 to June, nil.

This made a total of 7,562 Kg. of narcotics exported by one firm in the period named.

It has been estimated that the legitimate requirements of a country amount annually to 1 Kg. of heroin per million persons. Thus the requirements of the world (taking the population at 1,646 millions) would be about 1,700 Kg. Yet in 1928 this one Alsatian firm manufactured two and a half times this quantity, and it is only one of several factories manufacturing the drug in central Europe. In Switzerland there is an extensive illicit drug traffic. A small restaurant was discovered on the Swiss-Italian frontier which was used as a sort of post-office for the traffic. Parcels arrived from various quarters to be called for and on them the "contrebandier" had for years been drawing commissions. A big international organization has been broken up by the Swiss police. A mid-European channel has been discovered along which runs a steady stream of dope to the ports of Genoa, Trieste, Piraeus and Constantinople and thence to Alexandria. Statistics show that among 1,614 local traffickers reported to the Cairo bureau there were 105 Greeks, thirty British, twenty-one Italians, thirteen French, five Turks, a Syrian and a Russian, the remainder being Egyptians. Among the Egyptian population of 14 millions there are probably more than half a million drug addicts who spend annually $67,000,000 on narcotics and are out of action as useful members of the community.

Roentgen Analysis of Cellulose

In a lecture on cellulose in the light of the x-rays, given at the Royal Institution, Sir William Bragg began by referring to the discovery that in nature certain atoms, certain molecules and certain combinations of molecules were highly preferred to all others. Oxygen atoms made up half the known world, silicon and aluminum the greater part of the other half. Most of the ninety kinds of atoms might be said to be present in traces only. The seas gave to the water molecule easy precedence over others; in the rocks, combinations consisting mainly of oxygen and silicon were predominant. Carbon atoms were few in comparison with all that the earth contained; but they had a special distinction through their being largely used for the building of living things. Of their combinations with other atoms, especially oxygen, nitrogen and hydrogen, an infinite number could be conceived; yet few were singled out for almost universal employment. There was the long-chain type, of which the links were made of carbon-fats, greases, paraffins and the like. A second type was built on the benzene ring, of which the core consisted of six carbon atoms arranged in a hexagon. This was the basis of many dyes, explosives and drugs. Cellulose, the fundamental molecular combination in vegetable growth, was essentially some multiple of six carbons, ten hydrogens and five oxygens. The six carbons were arranged in a sequence but did not make a long chain. Five of them with the oxygen made a ring and the remaining carbon with certain attachments hung therefrom. This construction was the basis of plant life. From roentgen analysis it appeared that cellulose was composed in part at least of a mass of small crystals. That the same diagram was obtained from all fibers, even from animal cellulose, showed that we were dealing with the same substance. Measuring the spaces in the diagram showed that there was in each crystal a

periodicity parallel to the direction of the fiber. Such a periodicity fell naturally into a scheme hinted at by the chemical results. Thus both roentgen and chemical evidence suggested a long chain of many links. The bonds that tied the links together were far stronger than those which tied the chains together. It seemed that bundles of these long chains formed "crystallites," small crystalline masses of which the cellulose was largely composed. When a thread was stretched the x-rays showed that these bundles went more and more into line. When the stress was too great the bundles began to slide past one another, and if the force was too great they let go and the thread broke. Thus the basis of fiber in nature was this elemental fiber of rings in series. The thread or the rope was a large scale reproduction of a process already begun by nature. The diamond was extremely rigid because these strong bonds were exerted in every direction, but in the fiber the strong bonds were in only one direction.

Cellulose from the Air

Dr. Herbert Levinstein, president of the Society of Chemical Industry, in an address to the Institution of Chemical Engineers suggested that just as nitrogen for fertilizers was obtained from the air, so illimitable supplies of cellulose—the raw material of paper, artificial silk and other products—may presently be obtained from the air. Sugar, which chemically resembled cellulose, had already been prepared synthetically from carbon dioxide and water.

The Cost of Social Services

The cost of "social services" is much disquieting thinking persons. The *Times* suggests that the time has arrived to take stock and balance the amount bought against the amount frustrated by the crippling of private resources and to decide whether the government should try to see how much the taxpayer can be saved instead of how much he can stand. This is the policy of countries which are our trade competitors. Per capita taxation in this country in 1928 was 98 per cent heavier than in France, more than 100 per cent heavier than in Germany and 250 per cent heavier than in the United States. Moreover, all these countries are reducing their taxation in order to increase the competitive power of industry. But in this country, already handicapped by the heaviest taxation in the world, a serious increase appears inevitable. We have already gone far beyond other countries in our social services. Free elementary education is provided for all children and free secondary education for a growing percentage. National health insurance covers the whole and unemployment insurance two thirds of the wage-earning population. When the school-leaving age becomes the age of entry into insurance, the British citizen will be helped and protected from the cradle to the grave. In addition there is the huge taxation-borne expenditure for the relief of poverty and destitution. Nearly half the total tax and taxation-borne expenditure is devoted to social services, to which the beneficiaries contribute only a fraction of the cost. The *Times* therefore asks whether the nation, in seeking by these means to make itself more efficient, is not depriving itself of the power to be so.

Safety and Comfort in Industry

The industrial museum of devices to promote the safety and comfort of workers has had some recent acquisitions as the result of research by individual firms or of the museum staff. Two models of ventilating shafts have been constructed to show the evils of a shaft with acute angles; another following the same course shows how, by stream-lining, a free flow may be assured and the diameter of the shaft gradually reduced after each junction. There is an air-tight chamber equipped to produce hot, humid and stagnant atmospheres and to show the relief which movement of the air, without actual ventilation, can bring. The reduction of noise by preventing echo resonance is demonstrated. The museum has taken up the recent idea of absorbing vibrations by layers of seaweed. The pneumatic chisels used by the modern stone-cutter produce much more dust than the old mason's chisels. For the prevention of silicosis the museum has in operation a pneumatic tool fitted with a cowl, into which most of the dust is sucked. Seats for workers at all sorts of jobs are shown—tip-up seats for use in brief intervals, adjustable seats, tiny low seats on roller skates used in artificial silk factories where the operatives have to change bobbins near the floor, and seats running on a sort of tramway for tapestry workers. All these illustrate the modern idea that fatigue lowers output. Some of the safety devices are an advance on the old idea of fencing; they are moving guards which push the hand of the operative into safety. A safety sausage machine is important in view of the frequency of accidents. The new machine has a feeding throat 7 inches long and only 2½ inches wide, so that the hand of the smallest assistant can no longer follow the meat down to the revolving knives.

Street Accidents and Speed

In a letter to the *Times*, Mr. Zachary Cope, surgeon to St. Mary's Hospital, has brought forward an ingenious argument. He takes the number of street accidents for the twelve largest cities in England (other than London) and compares them with those for the counties in which the cities are respectively situated. In every case the proportion of accidents is greater in the counties. Taking for 1928 the sum total of each group, the proportion of fatal to total accidents is 1 in 32.9 in the cities and 1 in 15.7 in the surrounding counties. Thus the chance of an accident being fatal is more than twice greater in the counties than in the cities. This might at first be thought to be due to better control of traffic in the cities; but the number of accidents in the cities is greater than in the counties in the proportion of 17 to 10, though the population concerned is approximately the same. Similar facts emerge from the London figures. If concentric circles are drawn round the city, the metropolitan police area and the counties round London, the proportion of fatal to total accidents in the central zone is 1 in 75, in the middle zone 1 in 42, and in the outer zone 1 in 17. Mr. Cope therefore draws the important conclusion that congestion of traffic predisposes to accidents but that excessive speed is the most important factor in fatalities—an argument against the proposed abolition of the speed limit.

PARIS

(From Our Regular Correspondent)

Jan. 15, 1930.

The Health Situation in France

The condition of the health services in France has been set forth by Mr. Landry, deputy from Corsica and formerly minister, in a comprehensive report to the chamber of deputies on behalf of the committee charged with the examination of the bill pertaining to the adoption of the budget of the minister of labor, public health, public welfare and social insurance. The 1930 budget of the minister represents, in comparison with that of 1929, an increase of more than 524 million francs (above $20,000,000). Most of the increase falls in the domain of public aid and welfare while the increase accorded to the prevention of disease is only 31,000,000 francs ($1,240,000). The study of morbidity and of mortality in France is difficult to pursue, owing to the lack or to the inaccuracy of the declarations. Nevertheless, the amount of sickness that can be regarded as avoidable, such as tuberculosis, syphilis and children's diseases, is considerable. The mortality rate of France for the year 1929 was 16.5 per thousand of population. There were only three countries with a higher mortality rate (Japan, Spain and Hungary). Especially among males of the 12 to 50 age groups is the mortality of France exceptionally high. Tuberculosis, which carries off more than 100,000 persons every year,

must be combated by a better system of ferreting out cases; that is, by increasing the number of dispensaries, directed by medical specialists who have no clientele of their own, by the immediate isolation of all patients in the hospital-sanatoriums, and by more ample aid given to the tuberculous and their families. The hospital equipment should be doubled by the addition of 20,000 new beds. Syphilis, a redoubtable disease, kills annually, it is estimated, 80,000 persons, occasions 40,000 abortions, and causes the death in utero of 20,000 children. It is, however, one plague which France today is best equipped to fight. A most determined effort has been made in recent years to reduce the ravages of syphilis. In the last thirteen years, 1,396 special services have been created, which, in 1928, held about two million consultations and performed more than a million therapeutic injections. Attention has been given to regulating prostitution, to the supervision of foreign workingmen, to the crusade against quacks, to the provision of better medical care for sailors, and to the organization of health propaganda. Landry points out that the nation is beginning to reap the fruits of this energetic action. The proportion of stillbirths has declined from 44.4 per thousand in 1913 to 37.5 per thousand in 1927. But it is the infant mortality that constitutes the greatest peril. The most important thing to do is to aid and protect the mother, to assure her the rest necessary during pregnancy, to increase the number of prenatal consultations, and to create homes for mothers. The protection of the child should be carried out chiefly in the home with the aid of cantonal centers and with the collaboration of the general practitioner and the visiting nurse. That is the price that France must pay if we hope to lower the infant mortality rate, which is at present 83 per thousand living births.

Hospital for Persons of Moderate Means

A movement is on foot to provide in Paris an institution that is much needed. The hospitals of the Assistance publique are intended primarily for the poor. The sanatoriums and the clinics demand today such high prices that only the rich can afford to patronize them. There is a large number of persons occupying an intermediate social position who cannot receive at home medical or surgical care under favorable conditions, and yet cannot be admitted to the hospitals of the Assistance publique or pay the charges of a sanatorium. To this class belong most brain workers, the employees and the subordinate officials, or civil servants so called. In view of the unfortunate situation in which such persons are placed, a number of "friends of France" have long sought to remedy the situation by creating a hospital intended for the class described. Desiring, above all, that the undertaking should be strictly French, Mr. Georges Washington Lopp, Mr. Bernard H. Flurcheim and Mr. Walter V. Cotchett thought that the hospital contemplated could not be better dedicated than to the memory of the great man whose simple and laborious life, crowned with so pure a glory, will remain an eternal example for mankind: Marshal Foch. A committee has been appointed to collect funds for the erection of this hospital. The cornerstone will be laid, March 20, the anniversary of the death of Marshal Foch. The hospital will occupy, at the gates of Paris, an area of 10,025 square meters, at Boulogne-sur-Seine, near the Seine, between the pont de Sèvres and the pont de St. Cloud. The French architect A. E. Fouqué, who will prepare the plans, has gone to America to study the latest features of modern hospitals. There will be 300 private rooms distributed over five floors. The rez-de-chaussée will be given over to the administrative services, the consultation rooms and the laboratories. In the center of the top floor will be the operating rooms and the surgical services. Two annexes, at the right and at the left of the main entrance, will be used as a training school for nurses and as a dormitory for the attending personnel of the hospital. A permanent committee will see that admission to the hospital shall be reserved for those for whom it has been founded. The charges for a private room will be fixed at 50 francs ($2) a day, including medical care, nurse supervision and food. The lowest possible fee schedule will be established for surgical operations. The estimated cost of the erection and equipment of this institution is around 35,000,000 francs ($1,400,000). The committee has already collected a considerable sum and is now making an appeal to the large administrations and to philanthropic private citizens.

Insanity in Paris

From an inquiry instituted by Dr. Toulouse, it appears that there were 14,824 mentally ill persons in 1929 in the department of the Seine, as compared with 14,503 in 1928. About 50 per cent of these persons are cared for in institutions of the department of the Seine and the remainder have been sent to hospitals in the provinces. Dr. Toulouse holds that this number might be much reduced if the services of mental prophylaxis were better developed through free consultation at the hospital and supervision at home by visiting nurses. At present there is only one service of the kind in Paris, that in the Hôpital Ste. Anne, which has an annual budget of 3,500,000 francs.

BELGIUM

(From Our Regular Correspondent)

Jan. 4, 1930.

Conference on Uniform Formulas for "Heroic Drugs"

The Belgian government has taken up with the council of the League of Nations the matter of a resolution of the second international conference for the unification of the formulas of "heroic medicaments." The question concerns the creation of an international organization for the unification of the pharmacopeias and the appointment of certain special commissions. The Belgian government informed the general secretary that the international arrangement drawn up by the conference has been ratified by a sufficient number of countries and that consequently it desired the opinion of the League of Nations with reference to the creation of the international organizations contemplated.

The Pathology in Seven Cases of Dementia Praecox

In addressing the Société de neurologie, Drs. D'Hollander, Degreeff and Rouvroy pointed out how uncertain our knowledge of the etiology of dementia praecox is, in comparison with the enormous mass of clinical and psychologic material that exists on the subject. They gave the results of a study particularly of the brain and its meninges in seven patients with advanced dementia praecox. The lesions found were strikingly similar, including a case in which the onset was late and the evolution rapid. These lesions were extensive and affected the cortex, the white matter, the basal ganglions, the thalami, the medulla oblongata and the cerebellum. Neurologic proliferation was evident. The meninges were the site of an intense hyperplastic process and of an inflammatory process of long standing. The blood vessel walls and the perivascular sheaths were infiltrated. In general, the lesions were of the inflammatory type. Some nodules were found with even the characteristics of an infectious granuloma. The authors are inclined to believe that these lesions have a direct relation to the disease. Of course, they do not hold that the lesions "explain" the disease; they are only the consequence.

Public Health Administration in the Congo

In the chief town of every province in the Congo one finds, under the control of the provincial government, a body of technicians in charge of the health work of the province. The director is the "province physician," who is assisted by a medical hygienist and the provincial engineer and who may associate with himself any person competent to do hygienic

work. Such a person should have knowledge of the following subjects: hygienic measures pertaining to aggregations of people; the crusade against mosquitoes; the filling in of swamps, and all measures suitable to assure sanitation of the soil; the relocation of the camps or villages of the natives, so as to establish in cities a sanitary no man's land, to separate the city of the Europeans from the native village; the application of legislative or control measures calculated to prevent epidemics; the study and the proposal of new measures to be introduced in the same area, or modifications to be made in those already existing.

The technical management will supervise directly the execution of the hygienic measures, and of the regulations pertaining to the hygiene and public health of the centers. The management will keep records of matters pertaining to the province as a whole and to each center in particular, to include: complete information on sanitation; a chart of the public utility works; a program showing the progress in sanitation; a description of materials and methods used in sanitation work; a list of the sources of income in sight and proposed at the time of making the annual budget, account being taken, if need be, of the taxes and local subsidies accepted by or imposed on the population; a list of legislative and control measures pertaining to sanitation, and the supplementary measures to be carried out in case an epidemic develops.

The territorial authorities assume the responsibility for the execution of such work as cutting down underbrush; the planting of vacant portions of the public domain with vegetation suitable to prevent the breeding of mosquitoes; the keeping of buildings in a state of repair; the upkeep of drains and gutters; the removal of refuse, and the like.

Duodenal Stasis

In addressing the Société belge de gastro-entérologie, Dr. J. C. Roux of Paris brought out that duodenal stasis, by favoring the absorption of harmful substances, sets up an intoxication of a peculiar kind, due more to the intraduodenal pressure than to the nature of the absorbed substances. The intoxication may be of several types: 1. Intoxication affecting the nutrition of the patient, causing emaciation, especially in children, in whom growth continues without increase of weight. In almost twenty cases, the author noted, after duodenojejunostomy, the disappearance of the disorder, following a rapid gain in weight. 2. Duodenal nausea, which is more intense and prolonged than that associated with other gastropathies, and which becomes exacerbated during the passage of food. It may be checked by vomiting. In patients whose labyrinthine apparatus is sensitive, the nausea is frequently associated with dizziness. 3. Duodenal migraine, which is violent, appears as a result of duodenal distention and is terminated by the vomiting of bile or by diarrheal stools with bile content. Duodenal drainage effected by simply lying prone or, better, by duodenojejunostomy, will cause it to disappear. 4. Nervous disorders, syncope and convulsive crises. Here, too, surgical drainage causes the pathologic symptoms to disappear.

Treatment is based on the necessity of making the passage of the food more rapid in the mild cases by lavage of the duodenum before meals, by repose in the prone position, by wearing a low supporting abdominal bandage, and by prolonged rest. Surgical treatment in grave cases may be required to effect a cure. Delbet performs gastropyloroduodenostomy. Duval and Roux perform duodenojejunostomy.

The Prenuptial Medical Examination

Dr. Louis Vervaeck has published the conclusions he reached in an inquiry among a large number of lawyers, teachers and physicians in regard to the utility of the prenuptial medical examination:

If one extracts from the opinions expressed the suggestions that are of a nature to bring about within a short time a reform of a moral, social and medical order, the two steps to be taken in attaining the desired goal can be summarized as follows:

To prepare the way for the general acceptance of the prenuptial examination, an intensive publicity campaign must be organized on a scientific basis, emphasis being laid on the moral aspect of the problem. The publicity material must be addressed to all classes of society, including the medical profession, since its sympathy and interest are indispensable to the success of the reform. Two points must be emphasized: respect for individual liberty and the need of consulting a physician before becoming engaged to marry.

Prematrimonial consultation centers should be organized where specialists in eugenic medicine may be trained. Such a course of instruction, extending over three years at least, would, it is hoped, be sufficient to create a eugenic mentality that would fit one to carry out a prenuptial examination. Under these conditions the legal obligation would affect only the social strata that are neglectful of altruism and ideals.

If the publicity campaign should disappoint those who have confidence in it, they would then at least cease to oppose the promulgation of a prudent and moderate law.

Future spouses would be compelled to furnish proof that they had consulted the physician of their choice and had communicated to each other the opinions they had received. They would remain entirely free to marry in spite of any contraindications and possible dangers, provided they insisted on assuming the risks. Such a solution would take full account of the principles of morals and of individual liberty, which are the foundation of social life. It is hoped that the evolution of ideas in Belgium will lead to the enactment of such a law in the near future. As Dr. Marcel Pinard, physician to the Hôpital Cochin in Paris, states, "people insure their lives; they insure themselves against accidents; they have their lawyer, when they marry, draw up a contract that will protect, if need should arise, their financial interests, but they neglect to take such action as will effectively insure their health and that of their offspring." Physicians will agree that one of the best forms of insurance to promote happiness in the home is a medical consultation before marriage.

Tenth Congress of Neurology and Psychiatry

The committee on organization has decided to resume the sessions of the Belgian Congress of Neurology and Psychiatry, which were discontinued in 1914, as a result of the war. The tenth congress will afford an opportunity of celebrating, at the same time, the centenary of Belgian independence and the sixtieth anniversary of the existence of the Société de médecine mentale de Belgique. The congress will be held at Liége, July 26 and 27, 1930, under the honorary chairmanship of Prof. X. Francotte. The scientific program consists of two topics: (1) angioneuroses, presented by Divry and Moreau of Liége, and (2) congenital disorders of speech, to be considered by Jacques Ley of Brussels. One meeting will be devoted to general communications on various subjects, which must be announced to the secretary at least one month in advance. The dues have been fixed at 50 Belgian francs. Further information will be supplied by the secretary, Docteur Leroy, 30, rue Hemricourt, Liége (Belgium).

What Should the Medical Profession Do in the Automobile Accident Situation?

At the twenty-first Congress of Occupational Medicine, Drs. Firket and Ledent stated that the number of automobile accidents in Belgium is increasing from year to year. In 1927 there were 20,631 accidents, with 9,615 persons receiving injuries, 500 of which proved fatal. Such accidents constitute at present an important cause of death, to which the medical profession is compelled to give attention. In what manner, however, should it intervene?

The speakers reviewed the stages through which has passed the study of the question that now faces the congress and the Academy of Medicine. The creation of a medical certificate that must be secured before a person is permitted to drive an automobile raises many objections; yet, absolute liberty in the matter of driving is quite as objectionable. Professor Weekers shrewdly turned the question about by proposing to draw up a list of physical defects that render a person unfit to drive an automobile and to declare that whoever, having any of those defects, shall be responsible for an accident shall be punished more severely. The attitude is taken that it is a driver's duty to be examined, in order to discover whether or not he is suffering from any of the enumerated defects. Such an examination can be best made by the family physician, as he is the most familiar with all the conditions involved.

Medical intervention in the crusade against automobile accidents has another aspect: that which concerns accidents caused by a driver while intoxicated. Public opinion demands strict penalties in such cases. Definite criteria for the diagnosis of drunkenness are needed. In the countries that have studied the question, especially Denmark and England, the conclusion has been reached that the diagnosis must be made by a physician and rest on precise, recognized data. The authors pointed out also the advantage of establishing the aptitude of candidates by means of a psychologic examination similar to that which is required by aviation and some commercial transportation companies.

They proposed in conclusion the following resolutions:

Candidates should have free choice of a physician for examination for aptitude for driving an automobile.

The medical certificate as a basis for a driver's license, aside from the fact that it proved ineffective in the legislation of 1924, places too much responsibility on the physician. The Weekers plan is preferable.

A physician should intervene in the drawing up of certificates pertaining to the drunkenness of persons involved in automobile accidents.

Physicians are urged to educate the public, especially all persons directly interested, to the idea that driving demands unquestionable health and the possession of certain psychomotor qualities.

Polymorphism of the Diphtheria Bacillus

Mr. Lomry recently presented to the Belgian Royal Academy of Medicine a study on the polymorphism of *Corynebacterium diphtheriae*, which involves practical conclusions of great importance. In addition to the ordinary forms of the Loeffler bacillus in the pathogenic state, *Corynebacterium diphtheriae* takes on forms resembling the staphylococcus, the streptococcus, the pneumococcus, the enterococcus, the ordinary bacilli of putrefaction, and types of mycelium. Having taken the form of a saprophyte, *Corynebacterium diphtheriae* is just as prevalent in the throats as *Corynebacterium commune* and it does not lose its toxicity entirely. Consequently, it is impossible to ascertain by the microscopic examination alone whether or not a throat is rid of the diphtheria organism; morphology must give way to the biologic characteristics for the identification of *Corynebacterium diphtheriae;* it is possible for an organism to become immunized against diphtheria without one being able by a microscopic examination to recognize the causative agent on the mucosae.

The Separatist Movement in the Academies

A discussion was held recently before the Academy of Medicine on the subject of the creation of a Flemish academy, the Académie flamande de médecine, des sciences et des beaux arts. President Bordet set forth with emotion the dangers associated with such a project that has been submitted to the government. He said:

It is evident that the adoption of this measure would constitute an act of separatism of the most baneful import. It would drive a wedge into a large body of men trained in the same cultural ideas and actuated by the same ideals—all true Belgians whose inmost desire is to combine their efforts and to maintain close relation with one another, in order to render the greatest service to interests which transcend local pride and are common to all mankind; that is, progress in scientific knowledge and research. Belgian men of science will never be induced to accept such a discordant appeal. The academies are proud that they have been and still are, from the intellectual point of view, the representatives of Belgium as a whole, one and indivisible. When it is a question of purely literary institutions, it is comprehensible that the matter of language is a primary consideration, but for the savant the sciences are above languages; for him languages are only instruments of diffusion that he employs to spread the knowledge of his discoveries. He does not find it necessary to be concerned with the division of peoples into distinct nationalities. Doubtless all of us have had occasion, at some time, in connection with the publication of our articles, to make use of foreign languages. Linguistic liberty for the sciences is an absolute necessity. To decree the exclusive use of a given language for scientific discussions and writings would be absurd. But to impose that restriction on the basis of narrow linguistic rivalries and racial aversion would be an insult to science; it would signify an absolute misconception of what constitutes the true greatness of science and justifies the devotion that it inspires; that is, its humanitarian and international character; its eminent rôle in bringing together people of different civilizations; its peaceful mission; its great influence in accustoming men to sincere coordination of their efforts toward discoveries calculated to smoothe out racial antagonisms.

The text of President Bordet's address and a report of the meeting were dispatched to the seat of the government, after the academy had unanimously approved the communication and emphasized the importance of the considerations brought out at the meeting.

Antituberculosis Prophylaxis in the Congo Region

An order has been issued to prevent the increase of tuberculosis in the Belgian Congo. The order contains the following provisions: No person other than a Congolese may enter the Belgian Congo region to reside who is not provided with a medical certificate duly authenticated, issued by a licensed physician of the country of which he is a native or of the country where he last resided, and attesting that he is not affected with any form of active tuberculosis. Any person other than a Congolese, residing in the Belgian Congo region and found to be affected with active tuberculosis, must leave the territory within six months after the diagnosis is reached.

NETHERLANDS

(From Our Regular Correspondent)

Jan. 6, 1930.

Eightieth General Assembly of the Netherlands Society for the Advancement of Medicine

For the first time since 1889, the general assembly of the Nederlandsche Maatschappij tot Bevordering der Geneeskunst was held in Haarlem. The president's address constituted a eulogy of the rôle that Haarlem has played in medicine in the past 600 years. Attention was called also to the growing prosperity of Haarlem and to its fine suburbs and excellent museums. The president of the medical society of Haarlem thanked the president of the general association for his cordial words and gave evidence that Haarlem will continue to play a preponderant rôle by reason of the number of its intellectuals.

During the assembly, Professor Schuffner reported the results of researches on forty-six patients affected with Weil's disease. These cases were distributed over a period of six years as follows: 1924 (from October 1), two, both fatal; 1925, ten, two fatal; 1926, fourteen, four fatal; 1927, nine, two fatal; 1928, eight, and 1929, three, or a total of ten fatal cases out of forty-six.

A few cases have been reported by the Institut pour hygiène tropicale at Amsterdam; others have been cared for at the Laboratoire Central. Ten fatal cases among forty-six is evidence that the disease is sometimes grave; but there have been epidemics (for instance, in Burg, near Magdeburg) in which there were no fatal cases. The disease may develop at any time. It is most prevalent in August, September and October. In nearly twenty cases, the disease appeared to have been due to the fact that the patient was immersed in water, so that aspirated water came in contact with a large area of the mucosa, which is the mode of entry of *Leptospira* into the organism.

A large percentage of these cases developed in regions where the climate is damp (Amsterdam, fifteen cases; Rotterdam,

eleven). Nine did not present icterus. The author sums up his observations thus: 1. In case of high fever for which there is no evident cause, one may suspect influenza, which is an uncertain diagnosis, but also leptospirosis, bearing in mind that not all cases present icterus. 2. Leptospirosis becomes more likely if the disorder follows a fall in the water or a long swim. 3. The infection is transmitted by rats, dogs and possibly other animals, whose urine contains virulent *Leptospira*. The parasite enters the human body by way of the skin or the mucosae. 4. If the disease is associated with nephritis and swelling of the face, antiserum should not be administered. After the appearance of icterus, the serum is useless. 5. For the cultivation of *Leptospira* one may use either guinea-pigs, to which an intraperitoneal injection of 1 cc. of blood is given, or a liquid sterilized culture medium consisting of 1 cc. of blood combined with 10 cc. of supporting substances.

Necropsies and Medicolegal Experts

Dr. Mieremet of Groningen discussed recently the rendering of medicojudicial opinions in penal cases. In cooperation with court officials, he collected information on (1) the number of court cases in which expert medicolegal opinion was utilized; (2) the number of court cases in which an internal and an external necropsy were ordered; (3) the place where this research was made, and (4) the person to whom it was entrusted. The author gave the figures for the twenty-one judicial districts of the Netherlands. From 1920 to 1927, the number of judicial necropsies in the Netherlands ranged from 203 in 1922 to 263 in 1927. Amsterdam, the district with the largest number, had a minimum of thirty-nine in 1920 and in 1923, and a maximum of fifty-four in 1926. The Rotterdam district had the second largest number, with a minimum of twenty-three in 1922, 1924 and 1927, and a maximum of forty in 1926. The total number of necropsies in the twenty-one districts for the eight years was 1,849, an average of 231 a year.

The question as to whether the trial judge or the prosecuting attorney is entitled to summon medicolegal experts was investigated. Data collected by the author seem to indicate that, in the majority of the courts, it is customary to consult medicolegal experts. As for the place where the necropsies are held, usually the expert investigation is made where the person concerned died. The necropsy is, of course, more easily carried out in cities possessing a pathologic or anatomic laboratory and a hospital. It is of great importance that the person who performs the necropsy is really competent. Therefore, necropsies should not, as still sometimes occurs, be entrusted to physicians whose experience in pathology is not firmly established.

Creation of Society for Prevention of Blindness

A meeting was held recently in the Hague with a view to founding an international society for the prevention of blindness. The president is Professor de Lapersonne of Paris, who delivered the inaugural address.

Dr. Josephus Jitta, who spoke in behalf of the health commission of the League of Nations, said that the commission welcomed the creation of the new society. Professor Van der Hoeve, president of the International Congress of Ophthalmology, expressed the good wishes of the International Council of Ophthalmology.

Blood Analysis in Surgical Tuberculosis in Children

Dr. Huet recently communicated to the Netherlands Pediatric Society the results of his study on blood analysis in surgical tuberculosis in children. In most of the cases examined, a series of blood pictures was established. At the beginning of the disease, a rapid sedimentation of corpuscles was discovered, whereas it became normal in the following periods. That happens often after the part involved has been immobilized; otherwise one observes an increase in the rapidity of the sedimentation without aggravation of the disease. Examination of the blood, while important for the diagnosis, does not aid greatly in effecting a cure of the disease. The grave cases, or those with formation of pus, show a characteristic picture with rapid precipitation and leukocytosis. As soon as the abscess has been evacuated, the precipitation again becomes normal. During the general discussion, Haverschmidt asked whether among the children examined there were any that presented kidney disorders, since in that case, the same as in patients with congenital syphilis, the speed of precipitation is sensibly increased. Huet replied that the kidneys functioned normally and that there was in no case a positive Wassermann reaction. Kops remarked that the relation utilized by Huet is exact theoretically but not practically.

Congress of Child Health

At the first Congress of Puericulture in Amsterdam, many older ideas were emphasized and some new ideas were advanced: There is a tendency to pay more attention to the health of infants and school children than of children of preschool age. Between the ages 1 and 4, measles and whooping cough are the chief causes of death. Then come tuberculosis and influenza; then diphtheria and scarlet fever. To lower the child mortality rate, it was urged that the prevention of rickets, care of the teeth, vaccination, and the crusade against tuberculosis be applied more extensively to children of preschool age. Better supervision of the milk supply was advocated, attention being called to the excellent results secured of late by Norway. Better housing conditions for the poor, more recreation facilities in the open air for young children, under competent control, and the creation of more consultation centers for infant care were recommended. In discussing problems of heating, lighting and ventilation, it was said that windows should be wider than they are high—the reverse of the present system. One portion of children's playgrounds should be covered with a layer of sand, a second portion should be hard ground, and a third part should have a variety of plants, illustrating plant growth and leading up to a knowledge of growth in general. The need of more open-air schools for children and the value of school colonies for convalescents and weakly children were emphasized. Many paralytic children can be trained to walk, but the attempts commonly fail because they are begun too late. The same is true of congenital infirmities. All physicians should learn and apply the elementary principles of orthopedics. Rachitic deformities that can be completely cured by heliotherapy and fresh-air treatment should no longer be included among surgical conditions. There are three industries whose aid should be solicited in the prophylaxis of rickets: (1) manufacturers of products containing vitamin D; (2) manufacturers of irradiated foods with antirachitic properties, and (3) manufacturers of radiation apparatus of all kinds. The immunization of children against measles by the injection of convalescents' serum was advocated.

Opening of Orthopedic Clinic at Leyden

In an address at the opening of the Anna Orthopedic Clinic at Leyden, Nov. 11, 1929, Dr. W. Murk Janssen, director of the clinic, said that the hospital will be reserved for patients with diseases of the bones, muscles and joints. Minister Verschuur delivered the inaugural address.

Report on the Inspection of Labor

The report on the inspection of labor for 1928 is of medical interest. It surveys the industrial situation from the point of view of unemployment and discusses infractions of laws pertaining to the length of working hours, rest periods, and child labor. It demands laws governing the use of paints and varnishes, and points out that accidents due to electricity are constantly increasing, having reached 171 in 1928. The report calls attention to the danger of breathing in fumes of fertilizers composed of pulverized slag. An investigation was made of workers in aniline dyes and of those who handle flower bulbs.

For the latter, it has been found that a simple ointment or the application of a 10 per cent hydrochloric acid solution prevents the introduction into the skin of small crystals of calcium oxalate, which cause itching.

Ultraviolet Rays and Milk Production

Prof. H. M. Kroon has published in the *Tydschrift voor de Diergeneeskunde* the results of a study of the effect of ultraviolet rays on the production of milk. Following experiments on goats and heifers, he concluded that: (1) from the action of ultraviolet rays on the udder, only a slight increase of lactation was observed; (2) the feeding of irradiated food products seemed to increase somewhat the production of milk and butter fat, and (3) the action of the rays on the body of the animal seemed to produce the same result.

BERLIN

(From Our Regular Correspondent)

Jan. 18, 1930.

Psittacosis

As announced in the daily press, during the past few weeks, several cases of an infection traceable to parrots and known in the literature as psittacosis have been reported from various parts of Germany. A scientific discussion of psittacosis appeared in number 4 of the *Deutsche medizinische Wochenschrift*, from the pen of Professor Hegler, the director of the department of internal diseases in the Krankenhaus St. Georg in Hamburg. That the disease appeared first in Hamburg is not surprising, since Hamburg is the largest importing center for South American parrots. It is also an established fact that an epidemic among the parrots was observed last year in Argentina and Brazil. According to Professor Hegler's report, two patients with psittacosis were admitted last year to his department, one in July and one in November. At the time of the outbreak, following a slight epizootic in parrots, there developed, about eight days after the disorder appeared in the birds, a severe disease in all three members of a family. The symptoms of the disease resembled those of typhoid; there were, in some instances, distinct manifestations of pneumonia, and two of the cases ended fatally. No causative agent, such, for example, as Nocard's bacillus, or *Bacterium psittacosis*, was found in any of the three cases. Peculiar, from the clinical standpoint, was the familial appearance of the disease, the severe course, the serious psychic manifestations, which in the third case were explained in part by the conditions existing in the brain, and, finally, the absence of any considerable cough or expectoration, in spite of distinct pneumonic symptoms.

The bodies of the two parrots that had died a week previously were secured for examination. No paratyphoid-like microorganisms were found in the body fluids or in the intestine. A third parrot, which had been sick but had recovered, was carefully examined bacteriologically by Professor Jacobsthal. No paratyphoid-like causative agent was found in either the intestine or the blood. Dissection of the animal did not reveal special changes, the intestine and the lungs having been examined more particularly.

In the epidemic observed in November, six similar cases were involved. Although it could not be actually demonstrated that these cases were associated with a sick parrot, yet, in view of the high mortality (50 per cent), the presence of psittacosis appeared rather certain. According to the observations made in Hamburg, birds freshly imported from Brazil are most likely to transmit the disease to man. Whether only birds with evident signs of sickness (intestinal catarrh, coryza) transmit the disease, or whether it may be transmitted also by apparently healthy birds, are questions that remain to be settled. In all the cases the bacteriologic researches were without success, as far as *Bacterium psittacosis* is concerned. It is highly probable that the causative agent is not a bacillus at all but a filtrable virus, which possibly, analogous to other viruses, may combine with mixed organisms, pneumococci, streptococci, and the like.

According to the observations of Professor Hegler, in addition to intimate contact with infectious parrots, it is possible that transmission from man to man occurs.

In the next number of the *Deutsche medizinische Wochenschrift*, as that journal has announced, Prof. Fritz Meyer will have an article on the numerous cases of psittacosis in Berlin.

The Crusade Against Parodontosis

Owing to the difficulty of discovering the normal activity and the action of the nervous system and of the glands of internal secretion, but especially their disturbances, definite conclusions in regard to the ultimate causes of parodontosis have not been reached. Parodontosis is frequent and is increasing, and requires, with the coincidence of external and inner factors, not only local dental but also general medical treatment. In order to promote the clarification of all the questions as yet but incompletely solved, the Arbeitsgemeinschaft für Paradentose-Forschung (merger for the promotion of parodontosis research) was founded, five years ago. In addition to a popular leaflet on "Loose Teeth-Lost Teeth?" the purpose of which was to instruct and warn the general public in regard to the menace to the teeth that lies in parodontosis, it prepared also an exact diagrammatic exposition of the best method of examining the mouth and the whole body. This exposition takes account of the most recent dental methods and those of internal medicine. At the annual congresses of the research society, which are held under the chairmanship of Professor Loos, the director of the Dental Institute of the University of Frankfort-on-Main, and with the participation of a large number of investigators, from home and abroad, in the fields of internal medicine and dentistry, the case material thus obtained is worked over in thorough and comprehensive discussions. The next meeting will be held in Dresden in 1930, in connection with the International Hygienic Exposition, and will take up the subject of the consistent prevention of parodontosis as a demand of social hygiene. A new journal, *"Paradentium,"* which has as collaborators many well known authors in the fields of anatomy, pathology, internal medicine and dentistry, keeps the special professional circles informed in regard to the most recent results of research. The federal bureau for employees' insurance, which supervises the insurance issued to three million persons, and also the Reichswehr have given full attention to parodontosis. The Reichswehr employs dentists to give systematic treatment of this disorder of the jaws, while the federal bureau for employees' insurance grants, in severe cases, special benefits for dental care. The sick benefit associations are having some difficulty in introducing on a large scale this new form of dental therapy, owing to the peculiar nature of the disorder and the trouble associated with the diagnosis and treatment of parodontosis. An important element in the whole matter is the fact that the existence of incapacity to work, which is the first thing to awaken the interest of the administrations of the sick benefit associations, is, under certain circumstances, not so easy to prove or establish.

Marriages

LOUIS J. KOWALSKI, Passaic, N. J., to Miss Wauda E. Bukowska of Northampton, Pa., at Vienna, Austria, January 15.

ROBERT FREDERICK HARRIS to Miss Prudence Arnott Craig, both of Noblesville, Ind., Dec. 12, 1929.

HOWARD ALLISON MILLER, Paris, Ky., to Miss Rebecca Pullen of Anderson, Ind., Dec. 25, 1929.

CYRUS L. PICKETT, Laoag, P. I., to Mrs. Effie M. Campbell of Livingston, Tenn., Dec. 23, 1929.

RICHARD A. NAGLE to Miss Catherine Elizabeth Clark, both of Chicago, February 15

Deaths

Guy Lincoln Noyes ✠ Columbia, Mo.; University of Vermont College of Medicine, Burlington, 1894; University of Michigan Medical School, Ann Arbor, 1901; demonstrator of ophthalmic and aural surgery, University of Michigan, 1902; professor of diseases of the eye and ear, 1902-1910, and since 1913 dean, University of Missouri School of Medicine; member of the American Academy of Ophthalmology and Oto-Laryngology and the American College of Surgeons; formerly member of the executive council and vice president of the Association of American Medical Colleges; one of the founders and director of the Eugene Field Foundation for the Relief of Crippled Children; director of the University Hospitals, where he died, February 4, of heart disease, aged 57.

Athel Campbell Burnham ✠ Darien, Conn.; Columbia University College of Physicians and Surgeons, New York, 1906; member of the Medical Society of the State of New York; since 1922 connected with the State Charities Aid Association's Committee on Tuberculosis and Public Health as assistant in preventive medicine; served during the World War; aged 49; died, January 19, at Chapel Hill, N. C., of heart disease and nephritis.

Edgar Elmer Rice ✠ Shawnee, Okla.; Hospital College of Medicine, Louisville, 1896; member of the American College of Surgeons; president of the Pottawatomie County Medical Society; served during the World War; formerly assistant professor of gynecology, University of Oklahoma School of Medicine, Oklahoma City; on the staff of the Shawnee Municipal Hospital; aged 59; died, January 28, of cerebral hemorrhage.

Roland Hazen ✠ Paris, Ill.; University of Pennsylvania School of Medicine, Philadelphia, 1901; member of the Radiological Society of North America; formerly instructor in anatomy, Cornell University Medical School, New York; physician and surgeon in charge of the Paris Hospital; aged 53; died, January 14, of a self-inflicted bullet wound.

Edwin James Gardiner ✠ Chicago; Central University of Spain Faculty of Medicine, Madrid, Spain, 1878; member of the American College of Surgeons; formerly on the staffs of St. Luke's Hospital and the Illinois Charity Eye and Ear Infirmary; aged 73; died, January 9, at his home in Evanston, of heart disease.

Alfred Lawrence Draper ✠ San Francisco; Cooper Medical College, San Francisco, 1900; member of the American College of Surgeons; on the staffs of the University of California Hospital and the Franklin Hospital; aged 55; died, January 3, at the Stanford University Hospital, of pneumonia.

Francis Clemont Howard, St. Louis; Washington University School of Medicine, St. Louis, 1919; member of the Missouri State Medical Association, and the American Academy of Ophthalmology and Oto-Laryngology; aged 36; died, January 12, of chronic myocarditis.

Frederick William Browning ✠ Hayward, Calif.; L.R.C.P., L.R.C.S., Edinburgh, 1888, and L.F.P.S., Glasgow, 1888; health officer of Hayward; aged 64; died, Dec. 30, 1929, at the Southern Pacific Hospital, San Francisco, of carcinoma of the stomach with metastasis to the liver.

William H. Forrester, Lone Oak, Texas (licensed, Texas, under the Act of 1907); member of the State Medical Association of Texas; past president of the Delta County Medical Society; formerly postmaster of Needmore; aged 68; died, Nov. 17, 1929.

Edward R. Lynch, Brattleboro, Vt.; Baltimore Medical College, 1896; formerly member of the state legislature; superintendent of the Melrose Hospital; aged 59; died, January 16, at the Medical Art Sanitarium, New York, of septic pneumonia and arteriosclerosis.

John A. Campbell, Wheeling, W. Va.; Jefferson Medical College of Philadelphia, 1874; past president of the West Virginia State Medical Association; on the staff of the Wheeling Hospital; aged 77; died, January 5, of acute bronchitis and bronchopneumonia.

William Dorroh Ferguson, Laurens, S. C.; Medical College of the State of South Carolina, Charleston, 1897; member of the South Carolina Medical Association; past president of the Laurens County Medical Society; aged 57; died, January 4, of heart disease.

Arthur C. McLamore, Harlingen, Texas; University of Nashville (Tenn.) Medical Department, 1903; member of the State Medical Association of Texas; aged 52; died, Dec. 13, 1929, at Temple, of diabetes mellitus, nephritis and pneumonia.

Penlie Brisco Ledbetter ✠ Surg., Lieut. Commander, U. S. Navy, Washington, D. C.; Jefferson Medical College of Philadelphia, 1908; entered the Navy in 1911; aged 47; died, Dec. 28, 1929, at San Diego, Calif., of an incised wound in the neck.

Oliver Le Roy Fisher, Richmond, Ind.; Indiana University School of Medicine, 1923; served during the World War; on the staff of the Richmond State Hospital; aged 38; died, January 10, of rheumatic fever and chronic myocarditis.

Charles L. Carman, St. Paul; University of Minnesota Medical School, Minneapolis, 1897; member of the Minnesota State Medical Association; aged 70; died, Dec. 13, 1929, at St. Luke's Hospital, of arteriosclerosis and myocarditis.

Elbert Victor Kring, St. Louis; Barnes Medical College, St. Louis, 1909; member of the Missouri State Medical Association; served during the World War; aged 43; died, Dec. 1, 1929, at the Mount St. Rose Hospital, of tuberculosis.

Adam Henry Kalbfleisch, Peru, Ind.; Hahnemann Medical College and Hospital, Chicago, 1871; formerly secretary of the city and county board of health; aged 82; died, Dec. 3, 1929, in a sanatorium at Marion, Ohio, of senile dementia.

Francis Alpheus Drake, Buffalo; Trinity Medical College, Toronto, Ont., Canada, 1890; member of the Medical Society of the State of New York; aged 66; died in November, 1929, of coronary thrombosis and arteriosclerosis.

Armstrong Cooper Pratt, Chatsworth, Calif.; University of Southern California College of Medicine, Los Angeles, 1904; served during the World War; aged 55; died, January 1, of myocarditis and pulmonary embolism.

Leo Marks Sachs ✠ Buffalo; University of Buffalo School of Medicine, 1916; served during the World War; on the staffs of the City and Mercy hospitals; aged 35; died, Dec. 20, 1929, of carbon monoxide poisoning.

Thomas H. Curd, Middlesboro, Ky.; University of Louisville School of Medicine, 1879; member of the Kentucky State Medical Association; aged 80; died, January 24, at St. Joseph's Infirmary, Louisville.

William Wilson Sprowls, Houston, Pa.; Western Reserve University School of Medicine, Cleveland, 1884; member of the Medical Society of the State of Pennsylvania; aged 77; died, Nov. 17, 1929.

Theodore Francis Kollmar, Gary, Ind.; Indiana University School of Medicine, Indianapolis, 1916; aged 39; died, January 27, at the Mercy Hospital, of lobar pneumonia and myocarditis.

Charles William Lenhart ✠ Danville, Ill.; University of Louisville (Ky.) School of Medicine, 1911; connected with the Lake View Hospital, where he died, January 22, of pneumonia, aged 57.

Saul A. Koppnagle, Chicago; Bennett College of Eclectic Medicine and Surgery, Chicago, 1890; aged 70; died, February 7, of acute dilatation of the heart and chronic myocarditis.

Wesley L. M. Knowles ✠ Spooner, Wis.; University of Vermont College of Medicine, Burlington, 1897; aged 60; died, Dec. 12, 1929, at the Island City Hospital, Cumberland.

James Hampton Hays, Enid, Okla.; University of Michigan Medical School, Ann Arbor, 1901; member of the Oklahoma State Medical Association; aged 56; died, Nov. 27, 1929.

George S. Travis, East Stroudsburg, Pa.; Baltimore Medical College, 1896; member of the Medical Society of the State of Pennsylvania; aged 59; died, January 22, of angina pectoris.

Ludwig S. Platou, Valley City, N. D.; University of Oslo, Norway, 1893; mayor of Valley City; formerly bank president; aged 62; died, Dec. 16, 1929, in Minneapolis, of chronic nephritis.

David Decatur Grier, Gays, Ill.; Medical College of Ohio, Cincinnati, 1872; aged 80; died, January 29, at the Decatur and Macon County Hospital, Decatur, of cerebral hemorrhage.

Joseph W. Henderson, Berkeley, Calif.; Hahnemann Medical College of the Pacific, San Francisco, 1903; aged 71; died, Dec. 7, 1929, of chronic myocarditis and bronchopneumonia.

Charles Howard Sawyer ✠ Globe, Ariz.; Cleveland Medical College, 1880; formerly medical officer in the Indian Field Service; aged 72; died, January 3, of abscess of the brain.

James S. Chase, Topeka, Kan.; Western Reserve University School of Medicine, Cleveland, 1871; aged 81; died, January 23, in a local hospital, of cerebral hemorrhage.

Sigmund Goldberg ✠ Buffalo; University of Buffalo School of Medicine, 1884; on the staff of the Memorial Hospital; aged 74; died, Nov. 11, 1929, of chronic myocarditis.

John T. Hornbrook, Los Angeles; Medical College of Indiana, Indianapolis, 1881; aged 72; died, January 17, of chronic myocarditis and coronary arteriosclerosis.

Benjamin F. Carter, West Liberty, Ky.; Hospital College of Medicine, Louisville, 1875; aged 77; died, January 14, at the home of his daughter in Fort Meyers, Fla., of senile gangrene.

William Graham Snipes, Ladonia, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1887; aged 69; died, Dec. 26, 1929, in a hospital at Dallas.

Willis Whittier Creswell ✠ Elizabeth, N. J.; Medical Department of Hamline University, Minneapolis, 1897; aged 58; died, Dec. 27, 1929, of cerebral hemorrhage.

Romulus Bennick Hyder, Johnson City, Tenn.; Vanderbilt University School of Medicine, Nashville, 1916; aged 44; died, Nov. 13, 1929, at Jersey City, N. J.

George Martin Robinson ✠ Loogootee, Ind. (licensed, Indiana, 1897); formerly secretary of the board of health of Loogootee; aged 82; died, Dec. 15, 1929.

Addison W. McCoy, Norwood, Ohio; Rush Medical College, Chicago, 1874; aged 80; died, January 4, at the Bethesda Hospital, Cincinnati, of arteriosclerosis.

Mathew Edward Grimshaw, Fairview, Alta., Canada; Queen's University Faculty of Medicine, Kingston, Ont., 1905; aged 49; died suddenly, Nov. 7, 1929.

William D. Hurford, Benton Harbor, Mich.; Jefferson Medical College of Philadelphia, 1878; aged 77; died, January 18, of cerebral hemorrhage.

Kavanaugh P. Perkins, Batesville, Miss.; Missouri Medical College, St. Louis, 1876; formerly county health officer; aged 74; died, January 4, of myocarditis.

Jesse Franklin Beabout, Casey, Ill.; University of Illinois College of Medicine, Chicago, 1928; aged 27; died suddenly, January 25, of heart disease.

Anna J. Crouthers, Elizabeth, N. J.; New York Medical College and Hospital for Women, 1882; aged 77; died, January 2, of diabetes mellitus.

George E. Dusenbury, Amherst, Wis.; College of Physicians and Surgeons, Keokuk, 1875; aged 82; died, January 25, of bronchopneumonia.

Joseph Salem Rubin ✠ Los Angeles; University of California Medical School, 1926; aged 30; died, January 18, of cerebral hemorrhage.

Sydney Leander Martin, East Chicago, Ind.; Leonard Medical School, Raleigh, N. C., 1908; aged 48; died, January 25, of heart disease.

George Oramel Moore, Sound Beach, Conn.; University of Michigan Medical School, Ann Arbor, 1867; aged 87; died, Dec. 20, 1929.

William Lewis Davis ✠ Albany, Ga.; University of Louisville (Ky.) School of Medicine, 1886; aged 65; died, Nov. 11, 1929.

George G. Cochran, Brooklyn; Medical Department of Columbia College, New York, 1884; aged 72; died, Nov. 9, 1929.

Patrick Eugene Hurley, Holyoke, Mass.; College of Physicians and Surgeons, Baltimore, 1900; aged 53; died, Dec. 19, 1929.

William Caldwell Davis, Summerfield, N. C.; Baltimore University School of Medicine, 1896; aged 72; died, January 15.

Abner L. Adams, Berkeley, Calif.; St. Louis Medical College, 1878; aged 72; died, January 13, in a hospital at Alameda.

Michaels E. Buellsfeld, Blackwell, Okla.; Medical College of Indiana, Indianapolis, 1895; aged 65; died, January 5.

James Allen Crafton, Memphis, Tenn.; University of Nashville Medical Department, 1897; aged 70; died in January.

Augustus M. Ziegler, Mingo, Ohio; Starling Medical College, Columbus, 1881; aged 78; died in January of heart disease.

John Patrick Shine, Holyoke, Mass.; Baltimore University School of Medicine, 1899; aged 59; died, Nov. 17, 1929.

Walter H. Herriott ✠ Freedom, Pa.; Jefferson Medical College of Philadelphia, 1908; aged 53; died, January 2.

Peter Scott ✠ Brooklyn; Anderson College of Medicine, Glasgow, Scotland, 1877; aged 75; died, Dec. 21, 1929.

Jacob Edward Strecker, Chattanooga, Tenn.; Chattanooga Medical College, 1891; aged 71; died, January 11.

Frank M. Neville, Canton, Ill.; Lincoln (Neb.) Medical College, 1901; aged 62; died, January 15.

CORRECTION

Dr. Joseph Alexander Parker is Not Dead.—The report of the death of Dr. Joseph Alexander Parker of Los Angeles in THE JOURNAL, Dec. 28, 1929, was erroneous. The basis of our report was a notice in *California and Western Medicine.*

Bureau of Investigation

MISBRANDED PHARMACEUTICALS

Abstracts of Notices of Judgment Issued During 1929 by the Food, Drug, and Insecticide Administration of the United States Department of Agriculture

(Concluded from page 503)

During 1929 the Bureau of Investigation published under the title "More Misbranded Nostrums," brief abstracts of Notices of Judgment issued by the Food, Drug, and Insecticide Administration of the United States Department of Agriculture. These have dealt with such proprietary medicines as had been found by government officials to be sold under claims that were false, misleading or fraudulent. During the same period there have been issued from the same source some Notices of Judgment against pharmaceutical products that were found to be adulterated or misbranded—or both—under the Food and Drugs Act. It should be noted that while these reports were issued by the government during 1929 the offenses charged were committed, in many instances, a year or more previously. A number of abstracts of these Notices of Judgment dealing with pharmaceutical products have appeared in THE JOURNAL during the past two weeks, and the final instalment is given here:

Marjoram.—R. T. Randall and Company of Philadelphia shipped in September, 1926, a barrel of marjoram from Pennsylvania to New Jersey, which the government declared was adulterated and misbranded. Adulteration was charged in that dirt and sand had been mixed and packed with the drug so as to reduce, lower and injuriously affect its quality and strength; misbranding was alleged in that the article was offered for sale under the distinctive name of marjoram when, in fact, it was a mixture of marjoram, dirt and sand. In July, 1928, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notice of Judgment 15897; Issued April, 1929.*]

Ergot.—King and Howe shipped from New York City to Baltimore in February, 1927, a quantity of ergot that the federal authorities declared was adulterated. Analyses of samples by the Bureau of Chemistry showed that its potency was not more than one half of that required by the United States Pharmacopeia. In April, 1928, King and Howe having appeared as claimants, judgment of condemnation and forfeiture was entered and the court ordered that the product be released on payment of costs and the execution of a bond conditioned in part that the ergot be returned to the custody of the customs collector to be exported from the United States.—[*Notice of Judgment 15801; Issued April, 1929.*]

Sodium Salicylate Tablets.—William R. Warner and Company, Inc., New York City, shipped into New Jersey in September, 1927, some sodium salicylate tablets that were declared misbranded. While labeled as 5 grain tablets, government analysis showed them to contain 4⅓ grains. In May, 1929, a plea of guilty was entered on behalf of the company and a fine imposed.—[*Notice of Judgment 16373; Issued November, 1929.*]

Strychnine Sulphate Tablets.—William R. Warner and Company, Inc., New York City, shipped in September, 1927, into the state of New Jersey a quantity of strychnine sulphate tablets that were declared adulterated and misbranded. While labeled as 1/100 grain, analysis showed that they contained approximately 1/124 grain of strychnine sulphate. In May, 1929, a plea of guilty was entered on behalf of the company and a fine imposed.—[*Notice of Judgment 16373; Issued November, 1929.*]

Sodium Salicylate Tablets.—The Shores-Mueller Company of Cedar Rapids, Iowa, shipped in January, 1928, from Iowa to Indiana a quantity of sodium salicylate tablets that the federal authorities declared were adulterated and misbranded. While the tablets were labeled as containing 5 grains, the Bureau of Chemistry found that they contained, on an average,

3.7 grains of sodium salicylate. In February, 1928, the Shores-Mueller Company having admitted the allegations of the libel, judgment of condemnation and forfeiture was entered and the court ordered that the product be released on payment of the costs and the execution of a bond, conditioned in part that they be remanufactured to bring them up to the declared strength.—[*Notice of Judgment 15809; Issued April, 1929.*]

Strychnine Sulphate Tablets.—In July, 1926, P. H. Mallen Company, Chicago, shipped into Michigan a quantity of strychnine sulphate tablets which were declared adulterated and misbranded. While they were labeled as containing 1/60 grain of strychnine sulphate to the tablet, they contained approximately only 1/80 grain of strychnine sulphate to the tablet. In May, 1929, a plea of guilty was entered and the court imposed a fine with costs.—[*Notice of Judgment 16389; Issued December, 1929.*]

Tincture of Nux Vomica.—William R. Warner and Company, Inc., New York City, shipped into the state of New Jersey in September, 1927, a quantity of tincture of nux vomica which was declared adulterated and misbranded. The charge was based on the fact that the product did not conform to the tests laid down in the Tenth Revision of the United States Pharmacopeia. In May, 1929, a plea of guilty was entered on behalf of the company and a fine imposed.—[*Notice of Judgment 16373; Issued November, 1929.*]

Strychnine Sulphate Tablets.—In December, 1925, Frank G. Scott of Detroit, Mich., shipped to Illinois a quantity of strychnine sulphate tablets which the government declared were adulterated and misbranded. They were labeled as containing 1/40 grain of strychnine sulphate when, in fact, they were found to contain not more than 1/46 grain. In November, 1927, the defendant pleaded guilty and was fined.—[*Notice of Judgment 15912; Issued May, 1929.*]

Atropine Sulphate Tablets.—The Pharmacal Products Company, Inc., Easton, Md., shipped in January, 1927, into the state of New York a quantity of atropine sulphate tablets that were adulterated and misbranded. While the tablets were represented to contain 1/100 grain of atropine sulphate, they actually contained only 1/150 grain. In February, 1929, following a plea of nolo contendere, the company was found guilty and a fine imposed with costs.—[*Notice of Judgment 16399; Issued December, 1929.*]

Nitroglycerin Tablets.—Frank G. Scott, Detroit, Mich., shipped in December, 1925, a quantity of nitroglycerin tablets, some of them labeled 1/100 grain and some labeled 1/50 grain. Analysis showed that the alleged 1/100 grain tablet contained not more than 1/2,000 grain; that labeled 1/50 grain contained not more than 1/1,785 grain. In November, 1927, the defendant pleaded guilty and was fined.—[*Notice of Judgment 15912; Issued May, 1929.*]

Nitroglycerin Tablets.—The Pharmacal Products Company, Inc., Easton, Md., shipped in January, 1927, into the state of New York a quantity of nitroglycerin tablets that were adulterated and misbranded. While labeled as containing 1/50 grain or 1/100 grain of nitroglycerin, respectively, the tablets, when analyzed, were found to contain in the former case not more than 1/77 grain of nitroglycerin and, in the latter, approximately 1/160 grain of nitroglycerin. In February, 1929, following a plea of nolo contendere, the company was found guilty and a fine with costs imposed.—[*Notice of Judgment 16399; Issued December, 1929.*]

Bacillus Bulgaricus Tablets.—Fairchild Bros. and Foster, New York City, shipped in July and August, 1928, to Louisiana a quantity of Bacillus bulgaricus tablets that the federal authorities declared were adulterated and misbranded. The preparation was labeled, "Contains the true Bacillus Bulgaricus . . . preserved in a stable, potent form." "It is rigidly standardized, potency guaranteed for the time stamped upon the label." According to the authorities, those claims were false and misleading, in that the strength or purity of the article fell below the professed standard under which it was sold. In October and November, 1928, judgment of condemnation and forfeiture was entered and the court ordered that the product be destroyed.—[*Notices of Judgment 16075 and 16089; Issued July, 1929.*]

Bacillus Bulgaricus Tablets.—Fairchild Bros. and Foster, New York City, shipped in October, 1928, into the District of Columbia a quantity of Bacillus bulgaricus tablets that were declared adulterated and misbranded. The charge was based on the fact that the tablets failed to contain a sufficient number of organisms per tablet to be efficacious. In February, 1929, judgment of condemnation was entered and the court ordered that the product be destroyed.—[*Notice of Judgment 16185; Issued August, 1929.*]

Bacillus Bulgaricus Liquid Culture and Tablets.—Parke, Davis and Company of Detroit, Mich., shipped to St. Louis, Mo., in May, 1928, a quantity of liquid culture Bacillus Bulgaricus and tablets Bacillus Bulgaricus, both of which were declared adulterated and misbranded. Federal analysis showed that the liquid culture contained either no viable lactobacillus organisms or not more than 1,000 of the organisms per cubic centimeter, while the tablets contained no viable lactobacillus organisms. In February, 1929, Parke, Davis and Company of St. Louis, Mo., appeared as claimants and, having tendered bond in the sum of $100, conditioned as provided by law, the court ordered that the product be approved and delivered to the claimant upon payment of costs.—[*Notice of Judgment 16388; Issued December, 1929.*]

Phenacetine Tablets.—P. H. Mallen Company, Chicago, Ill., shipped into Michigan in July, 1926, a quantity of phenacetine tablets that were adulterated and misbranded. They were labeled as containing 1 grain of phenacetin to each tablet, when, as a matter of fact, they contained only 3/4 grain of phenacetin to each tablet. A plea of guilty was entered in May, 1929, and the court imposed a fine with costs.—[*Notice of Judgment 16389; Issued December, 1929.*]

Cocaine Hydrochloride Tablets.—The Pharmacal Products Company, Inc., of Easton, Md., shipped in January, 1927, into the state of New York a quantity of cocaine hydrochloride tablets that were adulterated and misbranded. While these tablets were represented to contain 1.14 grains of cocaine hydrochloride each, they actually contained not more than 9/10 grain each. In February, 1929, following a plea of nolo contendere, the company was found guilty and a fine imposed with costs.—[*Notice of Judgment 16399; Issued December, 1929.*]

Arsenous Acid Tablets.—The Pharmacal Products Company, Inc., of Easton, Md., shipped in November, 1926, into New Jersey a quantity of arsenous acid tablets that were adulterated and misbranded. While the tablets were represented to contain 1/30 grain of arsenous acid, each tablet contained 1/39 grain of this substance. In February, 1929, following a plea of nolo contendere, the company was found guilty and the court imposed a fine with costs.—[*Notice of Judgment 16399; Issued December, 1929.*]

Quinine Sulphate Tablets.—The Pharmacal Products Company, Inc., of Easton, Md., shipped in September, 1926, into Pennsylvania a quantity of quinine sulphate tablets that were adulterated and misbranded. While the tablets were represented as containing 2 grains and 5 grains, respectively, of quinine sulphate, the former were found to contain only 3/4 grain and the latter only 3 2/3 grains of quinine sulphate. In February, 1929, following a plea of nolo contendere, the company was found guilty and the court imposed a fine with costs.—[*Notice of Judgment 16399; Issued December, 1929.*]

Tincture of Cinchona Compound.—The Pharmacal Products Company, Inc., of Easton, Md., shipped into Pennsylvania in September, 1926, a quantity of tincture of cinchona compound which was declared adulterated and misbranded. While the product was labeled as "Tincture of Cinchona Compound U. S. P.," it yielded less than 0.4 gram of the alkaloids of cinchona per 100 mils, as provided by the Pharmacopeia, containing in fact, not more than 0.345 gram of those alkaloids. In Feb-

ruary, 1929, following a plea of nolo contendere, the company was found guilty and a fine with costs imposed.—[*Notice of Judgment 16399; Issued December, 1929.*]

Calcium Lactate Tablets.—In December, 1927, and January, 1928, the Smith-Dorsey Company, of Lincoln, Neb., shipped into the state of Missouri a quantity of calcium lactate tablets that were adulterated and misbranded. While the tablets were represented as containing 5 grains each of calcium lactate, each tablet was found to contain only 4 1/10 grains of that substance. In March, 1929, a plea of guilty was entered and the court imposed a fine with costs.—[*Notice of Judgment 16395; Issued December, 1929.*]

Heart Sedative Tablets.—P. H. Mallen Company of Chicago, Ill., shipped in July, 1926, into Michigan some "No. 3 Heart Sedative Tablets," which were declared adulterated and misbranded. Each tablet was represented to contain 1/100 grain of glonoine, whereas they were found to contain not more than 1/1800 grain of glonoine. A plea of guilty entered in May, 1929, resulted in the imposition of a fine and costs.—[*Notice of Judgment 16389; Issued December, 1929.*]

Potassium Bromide Tablets.—The Smith-Dorsey Company, Lincoln, Neb., shipped into Missouri in December, 1927, and January, 1928, a quantity of potassium bromide tablets that were declared adulterated and misbranded. While each tablet was labeled as containing 5 grains of potassium bromide, they actually contained 5 2/3 grains of that drug. In March, 1929, a plea of guilty was entered and the court imposed a fine with costs.—[*Notice of Judgment 16395; Issued December, 1929.*]

Correspondence

WHERE IS THE BICHLORIDE IN "BICHLORIDOL"?

To the Editor:—The A. M. A. Chemical Laboratory recently reported (THE JOURNAL, Dec. 21, 1929, p. 1971) that samples of "Bichloridol" which it examined were found to contain much less mercury than was claimed on the label. On reading this report it occurred to me that the missing mercury had probably combined with the gelatin lining of the container ("collapsule"). Analyses showed that this explanation is correct.

The samples of "Bichloridol" analyzed by me were stated to contain "one-half grain (0.03 gram)" of mercury bichloride and had been purchased on the open market within the last year. The contents and container were analyzed separately, organic matter being oxidized by means of hydrochloric acid and sodium chlorate (Fresenius-von Babo method) and the liberated mercury removed electrolytically. The mercury so deposited was distilled from the electrode and weighed. These gravimetric results were checked by a colorimetric method that I recently developed (a report will be published in the near future) which gave practically the same figures. The results were as follows:

	Mercury Found, Expressed as $HgCl_2$		
	In the Contents of One "Collapsule"	Fixed in the Wall of One "Collapsule"	Total in One "Collapsule" and Its Contents
Collapsule 1....	0.0016 Gm.	0.0209 Gm.	0.0225 Gm.
Collapsule 2....	0.0018 Gm.	0.0235 Gm.	0.0253 Gm.

In order to test whether the mercury found in the container had simply precipitated from the paste, an empty container was boiled with water but no mercury dissolved, indicating that chemical union had probably occurred.

My results for the fraction of the mercury remaining in the paste (about 7 per cent) are lower than those reported by the A. M. A. laboratory, but this is probably explained by the fact that the laboratory examined 2-grain "collapsules," while those analyzed by me were the one-half grain size, which have a higher ratio of container surface to paste.

These analyses indicate that the manufacturers probably introduced about the stated amounts of mercuric chloride into these "collapsules" but that the lion's share of the dose goes to the container and not to the patient.

R. N. HARGER, PH.D., Indianapolis.
Associate Professor of Biochemistry
and Toxicology, Indiana University
School of Medicine.

[COMMENT.—Since the publication of the A. M. A. Chemical Laboratory's report, physicians who have inquired from the Duke Laboratories concerning the results have been informed that the product is exactly as stated by the company and that the difficulty with the A. M. A. analysis was in getting the true value of mercury in the presence of a fatty substance. Such an explanation needs evidence before it can be taken seriously.

It would be difficult to explain how mercury could possibly have escaped quantitative detection, particularly when the Carius method was used in addition to other methods. Because of the nature of its work, the laboratory takes exceeding pains in its chemical investigations. If some of the mercuric chloride enters into combination with the unsaturated fatty acids the product is mislabeled, because it is claimed to contain mercuric chloride. Nevertheless, the method used by the A. M. A. Chemical Laboratory would detect the presence of the mercury, whether present as mercuric chloride or as mercurated fat.

The president of the Duke Laboratories has informed the A. M. A. Chemical Laboratory that the firm does not analyze separate batches of its product. Recently a communication has been received from the firm stating that it had obtained the services of a chemist to investigate the product.

The foregoing communication from Dr. Harger, however, confirms the results of the A. M. A. Chemical Laboratory and shows that in the lower dosage forms the amount of mercury is even less than that found by the A. M. A. Chemical Laboratory (from one fifth to one tenth of the amount claimed). A communication has also been received from Dr. G. H. Bigelow of the Massachusetts Department of Health stating that the results of their recent analyses confirm the observations made by the A. M. A. Chemical Laboratory "as to the uselessness of bichloridol" as at present on the market. As in the case of other reports, including observations in the A. M. A. Chemical Laboratory, they also found the missing mercury in the coating. —DIRECTOR, A. M. A. Chemical Laboratory.]

THE TRICHO SYSTEM AGAIN

To the Editor:—I saw the following Tricho Institute case yesterday in my clinic:

Miss S. T., New York, a blonde with a fine complexion, gave a history of having received treatment at the Tricho Institute three years ago. There is now marked telangiectasia of the chin and anterior neck, with a little on the sides of the neck, which is very disfiguring. The telangiectasia did not appear until two years after treatment and has been getting steadily worse. There is also a little atrophy. In spite of all this, the woman still has considerable hair in the area involved!

GEORGE MILLER MACKEE, M.D., New York.

[COMMENT.—This makes the twentieth case of disfiguring x-ray burns following the use of the Tricho System for the removal of hair that has been reported in THE JOURNAL. How much longer will the health authorities of the country permit beauty parlors to continue to use Albert C. Geyser's dangerous and misleadingly advertised device?—ED.]

The Need for Discussions.—No class of men needs friction so much as physicians; no class gets less. The daily round of a busy practitioner tends to develop an egoism of a most intense kind, to which there is no antidote. The few setbacks are forgotten, the mistakes are often buried, and ten years of successful work tend to make a man touchy, dogmatic, intolerant of correction, and abominably self-centered. To this mental attitude the medical society is the best corrective, and a man misses a good part of his education who does not get knocked about a bit by his colleagues in discussions and criticisms.—Presidential Address by William Osler before the Medical and Chirurgical Faculty of Maryland, in Sir William Osler, by Harvey Cushing, vol. 1, p. 447.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

VIOSTEROL OR IRRADIATION

To the Editor:—I am in doubt as to whether the irradiated sterols, e. g., viosterol, may be properly used as substitutes for the more expensive ultraviolet ray treatments, and, if so, to what extent. Please use initials only.

M.D., Massachusetts.

ANSWER.—The reply depends in some measure on the therapeutic ends that are in mind. If rickets is the disorder that is to be cured or averted, both cod liver oil and irradiated ergosterol, the latter now available in standardized solutions under the name of viosterol in oil 100 D, act as specifics; so that irradiation with artificial light sources is not essential though its effectiveness to accomplish the same ends deserves emphasis. Viosterol also serves to promote the proper metabolism of calcium and phosphorus in other disorders in which this may be involved, and it is effective in the treatment of certain types of infantile tetany.

On the other hand, irradiation with ultraviolet rays doubtless produces a variety of physiologic effects about which we are still largely uninformed; at least many of the alleged manifestations remain under debate. They include various influences on the blood and circulation that remain to be carefully evaluated. Some of these certainly are not secured through the use of viosterol. Some of the difficulties involved lie in our ignorance of how much ultraviolet irradiation the human being really needs or can tolerate without detriment. These are dangers in the careless use of artificial sources of irradiation that need to be carefully guarded against. Some of the details will be found in such books as Mayer's "Clinical Application of Sunlight and Artificial Radiation" or in Laurens' summary on "The Physiological Effects of Radiation" (*Physiol. Rev.* **8**:1 [Jan.] 1928). An excellent summary has just been published by Katherine Blunt and Ruth Cowan: "Ultraviolet Light and Vitamin D in Nutrition," University of Chicago Press. Some of the chapters have appeared in recent issues of THE JOURNAL.

IMMUNITY TO SMALLPOX AND VACCINATION

To the Editor:—Will a new-born baby have inherited immunity against smallpox from its mother who shows an immunity reaction on vaccination? If so, how long will inherited immunity remain active? At what age should a baby be vaccinated against smallpox? Kindly omit name.

M.D., Cristobal, C. Z.

ANSWER.—Exact and reliable information regarding the matter raised by the first two questions is not available. A baby should be vaccinated between 6 months and 1 year of age; but in the presence of danger of infection, the vaccination may be performed at any time after birth.

ETIOLOGY AND TREATMENT OF HERPES ZOSTER AND HERPES SIMPLEX

To the Editor:—What are the possible etiologic factors in an oft repeated herpes zoster (facialis)? There have been recurring lesions at irregular (nonseasonal) intervals in a young adult. These lesions always occur on one side of the upper lip, but the last crop occurred a little bit outside the corner of the lip toward the cheek (on the same side as the former lip lesions). A search for focal infection involving the teeth and the sinuses has been of no avail. Is there any possible allergic basis for this condition, since there are other allergic manifestations in the history? Once the lesions appear, of what value is local abortive treatment and what is the best procedure? Is there any value in a smallpox vaccination in this condition, the patient not having been vaccinated in more than fourteen years? Please omit name.

M.D., New York.

ANSWER.—The disorder described is herpes simplex, not herpes zoster. A recurrent herpes is not uncommon. It sometimes extends over a period of ten or more years, coming on various areas of the face, buttock and other situations, and practically always in the same spot. It occurs more often in children but also in adults.

It will not be necessary to go over the entire etiology. The investigation has been carried on properly, as the disorder is often due to an inflammatory condition in the neighborhood. In this instance, it might be dental caries, alveolitis, pulpitis, gingivitis, rhinopharyngitis, inflammation of one of the neighboring sinuses or otitis; not infrequently it is a toxic condition produced by what is apparently a moderate gastro-intestinal disturbance. Allergy has to be considered, as food allergy and physical allergy produce it; for instance, cheese and the sun's rays. Herpes as symptomatic of infectious disease could be ruled out here, but this type gives a clue as to the mechanism of its production.

Good results in recurrent herpes come from treating the area with roentgen rays. This should be done by some one familiar with this treatment so as not to overdo it. From four to six treatments are usually given, each consisting of one-fourth skin unit, the treatments being repeated at weekly intervals. It is seldom necessary to give any patient more than three periods of treatment. Most cases clear up with one.

There is no apparent reason why vaccination should be employed. The virus of chickenpox and herpes zoster is supposed to be identical in some cases, but as this is not herpes zoster there is hardly any reason why it should be considered.

VARICOSE VEIN OF BROAD LIGAMENT

To the Editor:—What is the best surgical treatment for rupture of the varicose vein of the broad ligament in a woman six months pregnant? The bleeding was severe enough to cause shock and symptoms of internal hemorrhage. Kindly omit name.

M.D., New York.

ANSWER.—The only certain way in which a diagnosis of rupture of a varicose vein of the broad ligament can be made is by laparotomy. During pregnancy no attempt should be made to excise varicose veins of the broad ligament unless the appearance of the vein is such that further ruptures seem likely to occur. Ligation of the ruptured vein both distally and proximally to the site of rupture will usually suffice to check hemorrhage.

ONE DEGREE PRISM NEUTRALIZES TEN DEGREE PRISM

To the Editor:—In the issue of THE JOURNAL of January 11, the following statement is made as authentic: "A one degree prism can be thus revolved until it produces the effect or neutralizes a ten degree prism." Will you please prove the foregoing to me. I wish to challenge the scientist who will declare that a one degree prism can be manipulated to equal a ten degree prism, when it requires ten of those one-degree prisms to produce the ten-degree prism in the first place; and when you rotate a one-degree prism, it can go no farther but neutralizes itself when it reaches its axis. My specialty is dealing with prisms. They are my "pets" and I dislike seeing them abused. But I am open for conviction, so that I may learn for the benefit of humanity. A ten-degree prism may be rotated to equal a one-degree prism, but not vice versa.

OPTOMETRIST, Chicago.

ANSWER.—Bear cubs make nice pets, too, but a thorough understanding of them is necessary lest the position of master and pet be reversed. The same applies to prisms. A one degree prism can be revolved until it neutralizes a ten degree prism, but, to comprehend that seemingly anomalous statement, three dimensional thinking is necessary. The one degree prism must be revolved with the base as an axis and not perpendicular to the optical axis. This can be proved easily by holding a ten degree prism, say base up, before one eye, and, in front of that, a one degree prism base down. Then revolve the one degree prism so that its apex approaches the optical axis of the eye; that is, tilt the prism away from the frontal plane of the face. When the plane of the ten degree prism, which has remained stationary, and the plane of the one degree prism, which has been tilted, form an angle of approximately 75 degrees, it will be seen that the one degree prism has neutralized the ten degree prism. For the analytic and mathematical consideration of this problem, the reader is referred to "Mirrors, Prisms and Lenses" by J. P. C. Southall, published in 1923, pages 116 to 120, which deal with the minimum deviation by a prism and grazing incidence and emergence.

CUBIC FEET OF SPACE PER PERSON REQUIRED FOR SUITABLE VENTILATION

To the Editor:—Can you inform me how many cubic feet of space should be allowed, to conform to standard health requirements, in planning space for office employees? The information will be applicable to Rio de Janeiro, where the indoor temperature varies between 14 and 38 C. (57 and 100 F.).

GILBERT HEARN, Rio de Janeiro, Brazil.

ANSWER.—The cubic feet of space required per individual in factories and mercantile establishments has been more or less standardized in the United States. In certain states, standards have been made legal through industrial codes. From 300 to 500 cubic feet should be allowed for each employee. This amount is somewhat dependent on the height of the room, and the figures as given would apply to rooms not more than 10 or 12 feet in height.

Cubic feet of space per person is only one factor to be considered. A second is the interchange of air by either natural or artificial ventilation. This should be such that there is a complete renewal of air two or three times an hour. A third

factor is the placing of employees so as to avoid interchanging germs. This can usually be done but is sometimes neglected through carelessness. Employees are seated directly opposite each other at relatively narrow tables or desks when it would be perfectly easy to separate them at distances of 5 or 6 feet or to place them in such a way that the chance of conveying infection is reduced to a minimum.

SYMPTOMATOLOGY IN AMAUROTIC IDIOCY

To the Editor:—I have under my care a Jewish girl, 22 months old, who has had from birth an amaurotic idiocy, diagnosed by the characteristic macular cherry spot and other signs. She appeared to be progressing normally in every other respect, excepting for listlessness and inability to sit up. I was summoned to see the child and found her with convulsive movements of the entire left side of the body followed by a complete left sided hemiplegia of the flaccid type. The child became drowsy but could be aroused. In about an hour she vomited and had a bowel movement, and this was followed by a complete recovery of the paralyzed side. What was the condition present, and how do you account for this sudden and complete recovery from the hemiplegia?

M.D., New York.

ANSWER.—Amaurotic idiocy is a progressive disease with an increasing paralysis of most parts of the body and a generalized ganglion cell degeneration in the whole central nervous system, particularly the cortex. While convulsions are not common, they may occur and they may happen to be unilateral. On account of the degeneration of the cells in the motor cortex it is natural that recuperation after the motor discharge is slow, and the transient paralysis is to be considered as being due to postconvulsive exhaustion of the motor centers.

WHITNEY'S REAGENT

To the Editor:—Will you kindly send us the formula for Whitney's reagent. We know this is a sugar test but fail to find it in any of our references here.

R. B. H. GRADWOHL, M.D., St. Louis.

To the Editor:—Can you give us any information in regard to a formula for Whitney's reagent, which we understand is a volumetric solution for the determination of sugar in urine? We have had a number of calls for this preparation and cannot seem to find the formula in any of the various textbooks and thought possibly you might be able to give us this information.

E. F. MAHADY COMPANY, Boston.

ANSWER.—The formula was given in Queries and Minor Notes (THE JOURNAL, Aug. 7, 1915, p. 550). The formula of the standard solution, parts by weight, is:

	Gm. or Cc.
Ammonium sulphate (C. P.)	1.2738
Copper sulphate (C. P.)	2.5587
Potassium hydroxide (C. P.)	19.1620
Ammonia water (specific gravity, 0.88)	312.2222
Glycerin (C. P.)	60
Distilled water to make	1,000

Whitney's reagent is not looked on with favor by the better workers in clinical chemistry. At best this reagent permits only an approximation to the actual quantity of sugar present in the urine, although, of course, it may be used for rough office work.

TREATMENT OF SYPHILIS

To the Editor:—I would like to get your advice in the following case: A woman, about 38 or 40 years of age, who had symptoms of Ménière's disease in 1926, has since that time lost her hearing. The blood Wassermann reaction was negative. At present her blood Wassermann reaction is negative. The dizziness has disappeared but her deafness is getting worse. I advised a course of treatment (bismuth-arsphenamine) although the Wassermann reaction is negative. I started to give sodium bismuth tartrate about one week ago. How many bismuth injections should I give as a course of treatment? Do you think this sodium bismuth tartrate is the best bismuth preparation, or do you know any other which is better? As my patient is quite fleshy and nervous, I decided to give the arsphenamine not intravenously but intramuscularly. What preparation would you advise to use and what strength? How soon would you give the arsphenamine: after how many bismuth injections, not to cause any harm to the nervous system? Please do not publish name in THE JOURNAL.

M.D., Minnesota.

ANSWER.—Before continuing with antisyphilitic treatment in this case it would be well to make certain that the patient has syphilis. Ménière's syndrome, although occasionally of syphilitic origin, may be caused by other conditions which will not be benefited by antisyphilitic therapy. The cerebrospinal fluid should be examined for the Wassermann reaction.

Bismuth compounds are usually given in courses of ten to twelve injections. Bismuth sodium tartrate is an acceptable bismuth preparation. Practically every pharmaceutic house markets one or more bismuth preparations and it is often difficult to choose between them. Physicians would do well, however, to use only those brands which have been accepted for New and Nonofficial Remedies.

For intramuscular use, sulpharsphenamine may be given in average doses of from 0.3 to 0.4 Gm. or bismuth arsphenamine sulphonate (bismarsen) in doses of 0.2 Gm. These may be given in courses of six to eight injections alternating with the bismuth. There is no danger of harm to the nervous system from the arsphenamine, except in those rare instances of a Herxheimer reaction or the toxic encephalitis from arsenic.

FUNGICIDAL DRUGS

To the Editor:—In your answer to a query concerning the "Fungicidal Value of Various Drugs" (THE JOURNAL, Nov. 16, 1929, p. 1583), you make no mention of copper salts (sulphate, citrate, etc.) and some other metallic salts that have decided fungicidal properties and that are certainly in more general use than chrysarobin or pyrogallol. Where would you rate these in the scale of potency quoted from Schaffer?

JOHN G. HANSA, Dunedin, Fla.

ANSWER.—Copper, which is markedly fungicidal, is not made use of in dermatotherapy, evidently because its action is too superficial. On the other hand, it would be much more useful than chrysarobin or pyrogallol in fungous infections of the mucous membranes.

GERMICIDAL SOAP—EFFECTS OF BARBITAL—PHENOL COEFFICIENT OF SATURATED SOLUTION OF SODIUM CHLORIDE

To the Editor:—1. Does the "Neko" brand of soap packed by Parke, Davis & Co. have any real germicidal effects? What is its phenol coefficient? 2. Just how does barbital affect the organs of the body and what particular ones? 3. What is the phenol coefficient of a saturated solution of table salt?

H. V. BURRUS, Camp Point, Ill.

ANSWER.—1. Neko Soap (Parke, Davis & Co.) is marketed in two forms, "Neko 1%" and "Neko 2%." The first is claimed to contain 1 per cent of mercuric iodide in the presence of potassium iodide, and the second 2 per cent of mercuric iodide in the presence of potassium iodide. The first was formerly called Germicidal Soap Mild. At that time the advertising issued by Parke, Davis & Co. claimed the product to have a "carbolic acid coefficient of 30." So far as we know, the only independent examination of the germicidal value of Parke, Davis & Co.'s product which has been published is that by Joseph H. Wildman in the Bulletin of the Massachusetts College of Pharmacy, January, 1919, p. 136. The author determined the germicidal value of three soaps, one of them being designated "Germicidal Soap" and stated to contain 1 per cent of mercuric iodide. The author reported that the phenol coefficient of this soap was less than 0.75. He did not publish the details of his work. From correspondence with the dean of the Massachusetts College of Pharmacy it appeared that the "Germicidal Soap" mentioned in the report of Mr. Wildman was that sold by Parke, Davis & Co. as "Germicidal Soap Mild." It is a question to what extent the determination of the phenol coefficient of a mixture of mercuric iodide and soap indicates the efficacy of the soap.

2. The chief action of barbital is on the central nervous system, the effect in medicinal doses being limited to the brain and the spinal cord. The main result is depression of the psychic areas in the brain resulting in sleep, which in lower animals especially may be preceded by psychomotor excitation with restlessness and tremors. In the spinal cord, the motor cells are more depressed than the sensory; reflexes are lost before the pain sense. That it also has some sedative effect on the medulla may be assumed from its clinical value in various forms of reflex vomiting. In toxic doses it paralyzes the brain, causing coma during which there may be nystagmus, an important distinguishing sign of this form of coma. It produces death by paralysis of the respiratory center in the medulla, respirations becoming slow and shallow, cyanosis setting in, and death occurring from stoppage of respiration. The next most important action of barbital is dilatation of the smaller blood vessels, partly from central but chiefly from peripheral action on the vasomotor nerves. The muscles themselves are not affected, as can be shown by the fact that epinephrine has its usual effect in barbital poisoning. The dilatation of the blood vessels of the skin leads to sweating, a tendency to lowering of the body temperature, and, in predisposed individuals, to skin eruptions which may assume a severe character. The increase in the caliber of the kidney blood vessels is probably chiefly responsible for the marked diuresis, occurring with therapeutic as well as with toxic doses. Barbital may also cause hematuria, necrosis of the kidney epithelium and anuria with preceding albuminuria, but also, without warning, clinical signs of nephritis. In fatal poisoning, congestion of all the

internal organs is constantly found, frequently with edema of the lungs and increased secretion of tracheobronchial mucus. Body temperature is lessened by full doses, partly because of the sweating and partly because of depression of metabolism. In acute poisoning, however, there may occur a peculiar disturbance of the heat center, leading to rise in temperature even up to 108 F.

3. Sodium chloride is a feeble antiseptic. For physicochemical reasons, germs do not grow in highly concentrated salt solutions. Methods of determining the phenol coefficient of a substance are generally considered inapplicable to products such as sodium chloride, and we do not know of any attempts to determine the phenol coefficient of a saturated solution of sodium chloride.

REMOVAL OF SCARS AFTER BURNS

To the Editor:—A young woman wishes to know whether anything can be done to remove or decrease the prominence of a scar on the neck and lower part of the face caused by a burn about fifteen years ago. Can you suggest any treatment or give the name of any reliable specialist who would take charge of such a case?

M.D., Illinois.

ANSWER.—With certain sorts of scars that produce deformity, the conditions may be improved by plastic operation. The only way to determine whether surgery is indicated in such cases is to consult a competent surgeon. Usually operation is not indicated in flat soft scars and there is no other way of getting rid of them. Thickened hypertrophic scars—keloidal scars—can often be greatly improved by the cautious use of x-rays or radium. One way of doing this is by repeated light exposures at intervals of about a week, not carried to the point of producing more than the slightest erythema. By careful procedure of this sort often these scars can be greatly improved; that is, they can be flattened down, softened and thus made less conspicuous and, if they are causing contracture, that condition improved. X-rays or radium offers the best prospect for improving such scars. If the scars are larger than small coin-size, x-rays are the most practicable agent.

POSSIBLE MULTIPLE SCLEROSIS

To the Editor:—A Swedish woman, 44 years old, developed headaches five years ago, then dizziness and finally ataxia one year ago. The patient presents ataxia with equally increased knee jerks and no tendency to fall to either side, no involvement of any cranial nerves except occasional buzzing in the ears, and a positive Babinsky reaction without staccato speech or intention tremor, with marked secondary anemia and normal gastric acidity and negative blood and spinal fluid Wassermann reactions. Kindly omit name and address.

M.D., Pennsylvania.

ANSWER.—The probable diagnosis in this case is multiple sclerosis, although the age of onset is rather later than usual. The type of sclerosis seen today in about 80 per cent of the cases shows as the predominating symptoms ataxia and spastic paraplegia. This patient has apparently not any signs of cerebrospinal syphilis, which is the most common condition one must differentiate from multiple sclerosis. The secondary anemia and normal gastric acidity probably rule out a combined cord degeneration. Probably a slowly developing chronic type of sclerosis is present without remissions, which implies that the case is hardly amenable to fever therapy.

FOOD ELEMENTS IN AJINOMOTO

To the Editor:—In the editorial comment on "Ajinomoto" (THE JOURNAL, Nov. 30, 1929, p. 1734) the substance is said to be made in large quantities for food purposes in the orient. What food elements does it have in it?

MARY DUNNING ROSE, M.D., New York.

ANSWER.—The precise chemical nature of ajinomoto is explicitly indicated in the editorial comment. It is the sodium salt of glutamic acid, one of the amino-acids formed in the hydrolysis of proteins and thus occurring as a product of the digestion of albuminous materials in the alimentary tract. Accordingly, the artificial product would presumably have the same calorific or food fuel value as that of an equivalent amount of the same amino-acid liberated in digestion. However, the material is obviously not used for its caloric value but rather as a flavoring agent, precisely as sugar and other condiments are employed.

POSSIBLE NEPHRITIS AFTER INTRAVENOUS USE OF CALCIUM CHLORIDE

To the Editor:—Will the continued use of 5 cc. of a 5 per cent solution of calcium chloride intravenously twice a week cause nephritis?

J. D. RILEY, M.D., El Paso, Texas.

ANSWER.—Probably not, as neither of the ions is toxic to the kidneys.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

ALASKA: Juneau, March 4, 1930. Sec., Dr. Harry C. DeVighne, Juneau, Alaska.

ARIZONA: Phoenix, April 1-2, 1930. Sec., Dr. H. P. Mills, 14 N. Central Ave., Phoenix, Ariz.

CONNECTICUT: Hartford, March 11-12, 1930. Sec., Dr. T. P. Murdock, 79 Elm St., Hartford, Conn.

MAINE: Portland, March 11-12, 1930. Sec., Dr. Adam P. Leighton, Jr., 192 State St., Portland, Me.

MASSACHUSETTS: Boston, March 11-13, 1930. Sec., Dr. Frank M. Vaughan, 144 State House, Boston, Mass.

MINNESOTA: Minneapolis, April 1-2, 1930. Basic Science. Sec., E. T. Bell, 110 Anatomy Bldg., University of Minnesota, Minneapolis.

MONTANA: Helena, April 1, 1930. Sec., Dr. S. A. Cooney, Power Block, Helena, Mont.

NEW HAMPSHIRE: Concord, March 13-14, 1930. Sec., Dr. Charles Duncan, Concord, N. H.

NEW MEXICO: Santa Fe, April 14-15, 1930. Sec., Dr. W. T. Joyner, Roswell, N. M.

OKLAHOMA: Oklahoma City, March 11-12, 1930. Sec., Dr. J. M. Byrum, Shawnee, Okla.

PORTO RICO: San Juan, March 4, 1930. Sec., Dr. Diego A. Biascoechea, 3 Allen St., San Juan, P. R.

RHODE ISLAND: Providence, April 3-4, 1930. Dir., L. A. Round, Ph.D., 319 State Office Bldg., Providence, R. I.

WISCONSIN: Madison, March 22, 1930. BASIC SCIENCE. Sec., Prof. R. N. Bauer, 3410 Wisconsin Ave., Milwaukee, Wis.

WISCONSIN: Milwaukee, April 8, 1930. Sec., Dr. Robert E. Flynn, 315 State Bank Bldg., La Crosse, Wis.

West Virginia November Examination

Dr. W. T. Henshaw, secretary of the Public Health Council of West Virginia, reports the oral and written examination held at Morgantown, Nov. 26-28, 1929. The examination covered 10 subjects and included 100 questions. An average of 80 per cent was required to pass. Twelve candidates were examined and passed. Thirteen physicians were licensed by reciprocity with other states and two were granted reciprocity licenses who had incomplete applications in June. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
Emory University School of Medicine		(1929)	87.3
Loyola University School of Medicine		(1929)	84*
Northwestern University Medical College		(1929)	87.1*
Rush Medical College		(1929)	84.5, 88.2
Indiana University School of Medicine		(1927)	85.1
Tulane University of Louisiana School of Medicine		(1928)	88.8
University of Maryland School of Medicine		(1929)	88.8
St. Louis University School of Medicine		(1928)	87.9
Medical College of Virginia		(1929)	86.7, 88.5
University of Budapest Faculty of Medicine		(1916)	80.7

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Louisville School of Medicine		(1927) (1928-2), (1929)	Alabama Kentucky
University of Michigan Medical School		(1925)	Michigan
University of Cincinnati College of Medicine		(1924)	Ohio
Jefferson Medical College		(1917)	Penna.
Medical Coll. of Virginia		(1923), (1925-2), (1927), (1928-2)	Virginia

	JULY RECIPROCITY	
Johns Hopkins University School of Medicine	(1925)	N. B. M. Ex.†
University of Pennsylvania School of Medicine	(1881)	Virginia†

* Applicants have finished their medical course and will receive M.D. degree on completion of one year's internship.

† Applications not fully completed in June.

North Carolina June Examination

Dr. John W. MacConnell, secretary of the Board of Medical Examiners of North Carolina, reports the oral and written examination held at Raleigh, June 24, 1929. The report covered 16 subjects and included 70 questions. An average of 80 per cent was required to pass. One hundred and two candidates were examined, 94 of whom passed and 8 failed. Twenty-one physicians were licensed by reciprocity with other states and 3 by the endorsement of their credentials. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
George Washington University Medical School		(1929)	95.5
Howard Univ. School of Med.		(1928) 80, 84.2, 84.9, 85.9, (1929)	88.9
Emory University School of Medicine		(1929) 82.7, 83.4,	86.6
University of Louisville School of Medicine		(1929)	83.1
Tulane University School of Med.		(1929) 84.5, 86.1, 86.6, 91.1,	92.6
University of Maryland School of Medicine		(1927) (1928) 86.1, (1929) 87.5, 90.5, 90.6, 90.7, 90.9, 91	85.8,

Harvard University Medical School.....(1929) 96.5
Washington University School of Medicine.....(1929) 88.1, 88.1
Long Island College Hospital.....(1929) 88.1, 91.1
Syracuse University College of Medicine.....(1929) 91.1
University and Bellevue Hospital Medical College.....(1929) 87.2
Jefferson Medical College.....(1929) 84, 85.1, 85.2, 88, 88.2, 88.5, 88.5, 88.6, 88.9, 89.1, 89.7, 92.1, 93.1, 94
University of Pennsylvania School of Medicine.....(1928) 80.5, 85.1, 90.4, 91, (1929) 84, 85, 85.2, 86, 86.1, 86.9, 87.2, 87.7, 88.4, 88.5, 88.7, 90.1, 90.4, 93
Medical College of South Carolina.....(1929) 82.7
Meharry Medical College.....(1923) *, (1927) 80.2, (1929) 83
Vanderbilt University School of Medicine.....(1929) 88.9
Medical College of Virginia.....(1928) 84. 85.6, 85.9, 88, 89, (1929) 82.9, 82.9, 83.1, 84, 84.6, 84.7, 85.1, 85.4, 86, 86.1, 86.2, 86.4, 86.6, 87.1, 87.1, 87.2, 87.4, 87.5, 88.6, 89.1
University of Virginia Department of Medicine.....(1929) 84.7
University of Vienna Faculty of Medicine.....(1922) 85 †

College	FAILED	Year Grad.	Per Cent
College of Physicians and Surgeons, Boston		(1911)	61.6
Leonard Medical School		(1513)	72.1
Meharry Medical College		(1927) 60.3, (1928) 76.3, 76.9,	78.5
Medical College of Virginia		(1929)	79.4
Non-graduate			53.4

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
George Washington University Medical School		(1909)	S. Carolina
Atlanta College of Physicians and Surgeons		(1911)	Georgia
University of Georgia Medical Dept.		(1915), (1925), (1926)	Georgia
Northwestern University Medical School		(1905)	Illinois
Rush Medical College		(1906)	Florida
Johns Hopkins University School of Medicine		(1925)	Maryland
University of Maryland School of Medicine		(1916)	S. Carolina
Tufts College Medical School		(1916)	Vermont
Medical Coll. of the State of S. Carolina		(1925-2), (1926-2)	S. Carolina
Meharry Medical College		(1919)	Illinois
University of Tennessee College of Medicine		(1917), (1924)	Tennessee
Medical College of Virginia		(1922)	Virginia
University College of Medicine, Richmond		(1908)	W. Virginia
University of Virginia Department of Medicine		(1922)	Virginia

College	ENDORSEMENT OF CREDENTIALS	Year Grad.	Endorsement of
College of Physicians and Surgeons, Baltimore		(1902)	U. S. Navy
Harvard Medical College		(1927-2)	N. B. M. Ex.
Jefferson Medical College		(1926)	N. B. M. Ex.

* No grade given.
† Verification of graduation in process.

Arkansas November Examination

Dr. Sam J. Allbright, secretary of the Board of Medical Examiners of Arkansas, reports the written examination held at Little Rock, Nov. 12-13, 1929. The examination covered 12 subjects and included 120 questions. An average of 75 per cent was required to pass. One candidate was examined and passed. Eight physicians were licensed through reciprocity with other states. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
Jefferson Medical College		(1929)	86.1

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
George Washington University Medical School		(1912)	Dist. Colum.
Emory University School of Medicine		(1923)	Georgia
Hospital College of Medicine of Louisville		(1907)	Virginia
Louisville Medical College		(1894)	Oklahoma
Tulane Univ. of Louisiana School of Med.		(1894), (1927)	Louisiana
Washington University School of Medicine		(1927)	Missouri
University of Tennessee College of Medicine		(1928)	Tennessee

Wyoming June and October Reports

Dr. W. H. Hassed, secretary of the Board of Medical Examiners of the State of Wyoming, reports the examinations held at Cheyenne, June 3 and Oct. 7, 1929. One applicant was examined and failed. Fourteen physicians were licensed by reciprocity with other states and 1 by the endorsement of his credentials. The following colleges were represented:

College	FAILED	Year Grad.	Per Cent
Hospital College of Medicine, Louisville		(1904)	71.3

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
College of Medical Evangelists		(1922)	California
Chicago College of Medicine and Surgery		(1913)	Illinois
Hahnemann Medical College and Hospital, Chicago		(1922)	Illinois
State University of Iowa College of Medicine		(1917), (1928)	Iowa
University of Louisville School of Medicine		(1916)	Illinois
Creighton University School of Medicine		(1928)	Nebraska
University of Nebraska College of Medicine		(1928)	Penna. (1926), (1927-3) Nebraska
Osteopaths		(1) Missouri,	(1) Montana

College	ENDORSEMENT OF CREDENTIALS	Year Grad.	Endorsement of
Harvard University Medical School		(1927)	N. B. M. Ex.

Book Notices

BLOOD GROUPING IN RELATION TO CLINICAL AND LEGAL MEDICINE. By Laurence H. Snyder, Sc.D., Associate Professor of Zoology, North Carolina State College, Raleigh. Cloth. Price, $5. Pp. 153, with 32 illustrations. Baltimore: Williams & Wilkins Company, 1929.

A unique interest attaches to the phenomenon of isohemagglutination. It segregates human beings in four distinct groups, thus bringing the "immunochemical" identification of the individual one step nearer, and it affords in the simple laboratory procedure required for blood grouping a common ground for investigations in such various fields as constitutional serology, physiology, pathology, heredity, genetics and anthropology. The author's point of view, he states, is that of the physiologist and geneticist, and as such he has carried on investigations of his own. Here he presents a review of the rapidly accumulating work on blood grouping, well arranged and condensed in convenient form, with suitable discussions and a rather complete bibliography: a book of real value both practically and theoretically. The most important clinical application of blood grouping pertains to blood transfusion. Several chapters deal with its history, the indications and contraindications, the choice of a donor and the technic of grouping, and finally the technic of the transfusion itself. The use of blood grouping in legal medicine is limited, the chief applications being in the determination of the group of dried blood (blood spots), thereby possibly strengthening or weakening the evidence against suspected persons of that group, and in the determination of the possibility, or the impossibility, of the parentage claimed for a certain child. The background necessary for the understanding of the work on parentage is presented in preceding chapters, on the establishment and subsequent stability of the blood groups, on mendelian inheritance and on the heredity of blood groups. These contain information and suggestions of wide biologic interest, as do the final chapters on blood groups in pathology, in animals, and on the racial distribution of the groups, subjects which as yet have little practical value from a clinical standpoint. Especially attractive, theoretically, are the studies of the genetic linkage relations of the blood groups and other hereditary factors both pathologic and physiologic. The author says: "It is important, then, to continue investigating the distribution of blood groups among various conditions. It is not proper, however, to consider these as linkage studies, nor to conclude that linkage is being determined, as so many writers have done. It is also important from a genetic standpoint to continue the true linkage studies by the family history method, theoretical though the importance may seem at the present time. Only thus is the knowledge of a subject rounded out. . . . And who may venture to predict the practical applications which find their bases in facts which at first seemed only of theoretical importance." The author's gratitude for the support that made this book possible will be shared by its many readers as part of their appreciation of the facts, references and suggestions presented.

GRUNDLAGEN DER ORTHODIAGRAPHISCHEN HERZGRÖSSEN- UND THORAXBREITENBEURTEILUNG IM KINDESALTER. Von Dr. Oskar Kirsch. Paper. Price, 7.20 marks. Pp. 110, with illustrations. Berlin: S. Karger, 1929.

In this brief monograph the author presents data carefully gathered and collated for a period of six years (1921-1927), including 142 patients ranging in age from 3 to 17 years. Kirsch presents his data in a series of four tables, which contain the measurements and facts resulting from his study. He observes that the determination of the measurements of the child's heart in relation to the other dimensions of the thorax is much more difficult than in the adult because of the constant growth in body length, which is relatively fixed in the adult. The author stresses Groedel's heart-lung quotient (the ratio of the cardiac transverse diameter to the pulmonary transverse diameter). At birth Groedel's quotient is 1.83, and it remains stationary for the first three months. In the fourth and fifth months it rises to 1.87, in the eighth and ninth months to 1.93, and at the beginning of the second year to 1.94. With progressive physiologic development, Kirsch notes that there is a relative narrowing of the transverse diameter of the heart.

There are two basically different methods of orthocardiography: the method wherein the absolute size of the heart is compared to the average tables of body weight and thoracic measurements, and the method wherein there is a proportional estimation of the size of the heart in relation to the individual's own body length and thoracic diameter. The author considers the former method inaccurate, whereas the latter is thought to be more suitable for purposes of comparison and more mathematically exact. Kirsch's studies offer no confirmation of the view of various authors that with increasing development of the thorax there is a relatively large increase in the cardiac diameter, usually considered as a "growth" hypertrophy or growth dilatation. On the contrary, he believes that such observations would indicate a tendency to retain fetal characteristics of growth rather than progressive development. Kirsch finds that during the first years of life there is a progressive relative diminution in the cardiac diameter; also that the transverse diameter of the aorta becomes comparatively smaller with increase in body length and body weight, a fact that has been corroborated by Beneke's studies on 600 cadavers. An interesting fact is the observation that during the first and second years of life the thoracic development is comparatively greater than the growth in length, and that at the end of the second year of life there begins a progressive diminution in the proportion of the thoracic and cardiac measurements. Dr. Kirsch's monograph is the result of a careful study, by orthodiagraphic methods, of the thoracic proportions and presents exact data and tables which should be of use to those who are interested in accurate cardiothoracic measurements and relationships.

THE TRAUMA OF BIRTH. By Otto Rank. Cloth. Price, $3.75. Pp. 224, with illustrations. New York: Harcourt, Brace & Company, 1929.

This aims to demonstrate the psychophysical basis for thought and the effect of prenatal life on mental life. In the preface the author states that psychoanalytic procedure penetrates to the fundamental base of mental life; the needs and demands of cells are the wishes and thoughts of man. In prenatal life these needs are met automatically. Birth brings this period of life to a violent end. Postnatal life is filled with struggle. Something which for want of a better term is thought of as the unconscious persists into postnatal life and leads to dissatisfaction and struggle. There are chapters on the analytic situation, infantile anxiety, sexual gratification, neurotic reproduction, symbolic adaptation, heroic compensation, religious sublimation, artistic idealization, philosophic speculation, psychoanalytic knowledge and the therapeutic aspect. Any formula, no matter how comprehensive, which claims to explain adequately all of man's difficulties and his mental life in general seems presumptuous. Some of the claims of "proof" also are hard to swallow. Aside from such criticism the book is tremendously stimulating, suggestive and, to the psychoanalytically minded, explanatory.

UEBER FREIEN UND GEBUNDENEN ZUCKER IN BLUT UND ORGANEN. Von A. Grevenstuk, Tz., Pharmako-therapeutisches Laboratorium in Amsterdam. Paper. Price, 16.50 marks. Pp. 249. Munich: J. F. Bergmann, 1929.

This is a compilation and organization of our present knowledge of a rather obscure subject. In it, what is known of the nature and quantitative variations of the bound sugar of the blood and tissues is clearly and systematically reviewed. By bound sugar is meant that reducing substance, over and above the blood sugar and nonfermentable reducing substances, which appears when blood is hydrolyzed in the presence of dilute acid. The author takes pains to point out that only a part of this additional reducing substance may be considered to be present in hexose form. He therefore suggests the less exclusive term "hydrolyzable substance" (abbreviated to Hy-S). The relative constancy of the hydrolyzable substance of the blood as determined by any given method on a particular species, and its quantitative variation under different physiologic, pathologic and experimental conditions, give rise to some fascinating speculations. The author stresses the fact that several diseases, notably carcinoma, are characterized by a raised hydrolyzable substance content of the blood. He strongly suggests that this fact be utilized more extensively as an approach to the investigation of these conditions. Numerous tables amplify the text.

EPIDEMIC ENCEPHALITIS: ETIOLOGY, EPIDEMIOLOGY, TREATMENT, Report of a Survey by the Matheson Commission. William Darrach, Chairman. Leather. Pp. 849, with illustrations. New York: Columbia University Press, 1929.

The members of this commission are William Darrach, chairman, Haven Emerson, Frederick P. Gay, William H. Park, Charles R. Stockard, Frederick Tilney, Willis D. Wood and Hubert S. Howe. The director of the survey was Josephine B. Neal and the epidemiologist was Helen Harrington. The object has been to collect and tabulate the reports of work on encephalitis from all over the world and thus to provide something helpful for all interested in this subject. The book is an indispensable reference work. The text is not as lengthy as might be assumed, as the bibliography, which is undoubtedly the most complete yet compiled, occupies 429 pages and the index eighteen pages. Not only has the world literature been digested but the commission has traveled about and interviewed workers both at home and abroad. A praiseworthy attempt was made to get the various investigators together so as to aid in determining the cause of the disease. The most interesting information is that Levaditi, the sponsor af the herpes theory, visited Rosenow, the chief defender of the streptococcic theory, and will carry on experiments to be reported later, the results of which may settle a long controversy. The chapter on epidemiology is by Dr. Harrington, most of the others by Dr. Neal, whose chapter on treatment has had the collaboration of Dr. Tilney. There is also a useful chapter on other types of encephalitis, particularly postvaccinal encephalitis. In the chapter on treatment every method used is mentioned, with the number of references and cases treated, and with comment on its value. Dr. William J. Matheson, whose support made this work possible, and the commission have earned the gratitude of all students of encephalitis.

HANDBUCH DER GEISTESKRANKHEITEN. Herausgegeben von Oswald Bumke. Band V: Spezieller Teil.—Teil 1: Die psychopathischen Anlagen. Reaktionen und Entwicklungen. Bearbeitet von K. Birnbaum, E. Braun, E. Kahn, J. H. Schultz, und G. Stertz. Paper. Price, 56 marks. Pp. 578, with 10 illustrations. Berlin: Julius Springer, 1928.

This volume of Bumke's great handbook dealing with psychopathic reactions and their development continues to maintain the high character of work promised by the earlier volumes of the series. This part is encyclopedic in character and discusses all phases of psychopathic reactions. Undoubtedly the completed series will exist for a long time as the most authentic psychiatric work.

OUTLINES OF BIOCHEMISTRY: THE ORGANIC CHEMISTRY AND THE PHYSICO-CHEMICAL REACTIONS OF BIOLOGICALLY IMPORTANT COMPOUNDS AND SYSTEMS. By Ross Aiken Gortner, Professor of Agricultural Biochemistry in the University of Minnesota. Cloth. Price, $6 net. Pp. 793, with illustrations. New York: John Wiley & Sons, Inc., 1929.

The author has rendered the literature of biochemistry a distinct service by developing a book that will enable students of biologic phenomena to have an insight into the degree to which organic chemistry and physical chemistry enable us to understand the processes of life. Even though there is no sharp distinction between phytochemistry and zoochemistry, the fact that the study of the chemical processes of plant life furnishes the central theme of this book should make it a welcome complement to the biochemistry books that are chiefly characterized by their aim to present the chemistry of human pathology. Especially should this book become an essential part of the libraries of schools of pharmacy; it might well serve as a textbook for courses on advanced chemistry in such institutions.

HANDBUCH DER ERNÄHRUNGSLEHRE. Von C. von Noorden, H. Salomon, und L. Langstein. Band II: Spezielle Diätetik der Krankheiten des Verdauungsapparates. Teil 1: Magen. Von Carl von Noorden, und Hugo Salomon. Enzyklopaedie der klinische Medizin. Herausgegeben von L. Langstein and others. Paper. Price, 39 marks. Pp. 459. Berlin: Julius Springer, 1929.

This large volume contains a good deal more than diet formulas and diet rules. Almost a fourth of the book is given over to general considerations of etiology and symptomatology of diseases of the stomach. Then the usual gastric diseases are thoroughly discussed and the dietary aspects considered. Both general and detailed information may be found. Apparently the effort is made to acknowledge various points of view. Since the present status of dietary therapy in gastric diseases cannot

be considered static, this presentation of opposing methods is necessary. The importance of psychotherapy in the so-called nervous dyspepsias is fully recognized and receives due attention. This volume is a valuable reference book on diseases of the stomach.

MINOR SURGERY. By Frederick Christopher, M.D., F.A.C.S., Associate in Surgery at Northwestern University Medical School. With a foreword by Allen B. Kanavel, M.D., F.A.C.S., Professor of Surgery, Northwestern University Medical School. Cloth. Price, $8 net. Pp. 694, with 465 illustrations. Philadelphia: W. B. Saunders Company, 1929.

A relatively large number of books on minor surgery, manuals of surgical technic, appear each year. The greater percentage are little more than worthless. Christopher's book is a brilliant exception. The scheme of the book is logical and interesting. The author has used the same plan that is followed in the better textbooks devoted to general surgery. The first part is devoted to wounds, foreign bodies, furuncles, carbuncles, burns and gangrene; the remainder covers regional minor surgery. Under the division of injuries, infections, tumors and deformities are included those of the head, neck, trunk, extremities, anus, rectum and genitalia. In the surgery of the extremities are included chapters on the more common fractures and dislocations. This is a wise procedure, because of the serious disability that follows improperly treated fractures, such as the Colles or the various elbow fractures that are frequently treated in the office. The illustrations are excellent. To the young surgeon who sees many industrial injuries and to the practitioner remote from hospital centers, such a textbook makes a valuable working manual.

FORTPFLANZUNGSSCHÄDIGUNG DER ERWERBSTÄTIGEN FRAU UND IHRE ABHILFE. Von Professor Dr. Heinz Küsner, Oberarzt der Universitäts-Frauenklinik, Leipzig. Paper. Price, 4.50 marks. Pp. 124, with 3 illustrations. Leipzig: Johann Ambrosius Barth, 1930.

During the last decade a large number of women have been employed in various occupational fields. This condition has had a definite effect on the health and well being of the women thus employed. The author points out how important it is not only for physicians but also for political economists and others to realize that much harm is being done to these women from the point of view of propagation of the race. He discusses the effect of employment in general, and of certain industries in particular, on the genital tract. He likewise considers the effect of industry on pregnancy and labor in these women. The last part of the book is devoted to means of diminishing the harm suffered by this class of women. Many of the problems taken up by the author are indigenous to Germany and do not arise in our country. Nevertheless this booklet should prove of interest not only to American physicians but also to public health officials, economists and clergymen.

INSOMNIA AND DRUG ADDICTION. By P. C. Collingwood Fenwick. Paper. Price, 2s. net. Pp. 55. London: H. K. Lewis & Company, Ltd., 1928.

This small book offers nothing of interest to any one at all familiar with the subject. It is essentially a lay treatise, both poorly written and antique in material. "I don't think the amount of the drug matters very much," is a quotation which illustrates the character of the book. In the treatment of addiction to members of the barbital group, the author recommends strychnine, 1/32 grain, or camphor in olive oil, 3 grains. "For the first three nights paraldehyde, 3 drachms, may be given without fear of habit formation." On the next page the author proceeds to discuss the treatment of paraldehyde addiction. In regard to the curability of morphinism, he thinks that 50 per cent of addicts are curable, a figure quite at variance with that of competent authorities.

LEHRBUCH DER GEISTESKRANKHEITEN. Von Oswald Bumke, Professor in München. Third edition. Paper. Price, 28 marks. Pp. 806, with 160 illustrations. Munich: J. F. Bergmann, 1929.

This edition of the "Textbook for Students and Beginners" has been partially rewritten. It has been considerably shortened in order to overcome the confusion to beginners of disputed and undecided hypotheses. The work is excellently written for students, as well as indexed, and contains numerous photographs. Especially noteworthy is the excellent chapter on neuropathology, written by Klarfeld.

Medicolegal

Compulsory Reporting of Births

(People v. Cramer (Mich.), 225 N. W. 595)

The defendant was convicted of violating the Michigan statute requiring physicians to report births. He carried the case by writ of error to the supreme court of Michigan, contending that the statute was unconstitutional. His contention was based most strongly on the claims that the time allowed for making the required reports, five days, is so short as to be unreasonable and that, since an unintentional violation of the law subjects the offender to a penalty, the law provides a cruel and unusual punishment. Numerous physicians testified to prove that the statute imposes an unreasonable hardship and that in many cases it is impossible to obtain and report within the five day limit all the information required by the statute. While it is obvious, said the supreme court, that in some cases compliance with this law may inconvenience the attending physician, it cannot be said that it imposes an undue hardship, in view of the importance of perpetuating the information reported. Nor can it be said that the five day limit is unreasonable, especially in view of the provision that if a physician "is unable to obtain any item of information required to be furnished, the registrar (with whom the report is filed by the physician) shall secure the same if possible from any person having such knowledge and complete the certificate of birth." The statute thus provides for filing an incomplete report when the physician cannot obtain all of the required information within the time limit.

The defendant contended that since the statute provides no fee for making such reports, it attempts to compel service to the state without compensation; that it thus undertakes to deprive of property, without due process of law, persons required to make such reports; and that it arbitrarily and unlawfully discriminates against physicians as a class. These contentions, however, the supreme court found untenable. The fact that employees in the health department are paid for compiling statistical facts from reports of births, while physicians are not paid for filing such reports, does not render the statute unconstitutional on the ground that, so far as compensation is concerned, it does not apply alike to all persons within the class affected by it. The statute applies specifically to certain persons in attendance at births, such as physicians and midwives, which is a complete and logical class distinction for the purposes of the statute. The practice of medicine, said the supreme court, is subject to regulation under the police power of the state, and any reasonable condition or requirement may be imposed by the state on those engaged in it.

The defendant contended further that the statute was unconstitutional because in an arbitrary, oppressive, and high-handed way it undertook to punish physicians where no wilfulness nor wrongful intent was involved and because it was an unwarranted delegation of legislative power to the state department of health. Both of these contentions, however, the supreme court found to be without merit.

The judgment of the court below was affirmed.

Fracture of the Leg; Intercurrent Pneumonia; Sepsis and Amputation

(Boston v. Fountain (Mass.), 166 N. E. 736)

The defendant, Fountain, treated the plaintiff, Boston, for a fracture of the leg, sustained, November 3. November 18, the patient had an attack of pleurisy or pneumonia, which apparently was treated by another physician. December 21, the defendant found the leg almost beyond repair, exuding pus, foul, and septic. At the defendant's suggestion, another physician was called in. The patient was then taken to a hospital and the leg amputated, December 24. From a verdict for the plaintiff, the defendant appealed to the Supreme Judicial Court of Massachusetts. The plaintiff contended that the defendant failed to discover that the fracture was an open fracture and to treat it as such. The defendant contended, however, that the fracture was in fact a closed fracture and was properly treated, and apparently attributed the septic condition of the fracture and the consequent

amputation to infection through the blood stream, resulting from the intercurrent pleurisy or pneumonia. There was evidence that when a fracture is closed it is possible for infection to reach the seat of the fracture by traveling through the blood or lymph stream, that in a closed fracture there is danger of infection from germs getting into the system from within but not from without, and that if there is such an infection it breaks out at the point where there has been a local injury. There was evidence, too, that if there was an open wound infection could have come either from outside the body or from the patient's lung.

In the course of the trial, the defendant asked that the jury be instructed that "if you find that the fracture was a closed one, without perforation of the skin, and remained so, there is no evidence of negligence on the part of the defendant contributing to the infection, and you must find for the defendant." It was not error, however, said the Supreme Judicial Court, for the trial court to refuse to give such an instruction, since the testimony warranted a finding that there was an open fracture with a small piece of bone sticking through the skin and that it should have been apparent to any physician and had a significance that would affect the defendant's treatment of the case. It was proper, too, said the court, for the trial court to instruct the jury, on request of the plaintiff, that if the pleurisy was causing the septic condition and the defendant failed to govern himself accordingly, the defendant would be responsible even though the septic condition did in fact arise from the pleurisy. This instruction was, it must have been understood, to be taken in connection with instructions previously given, and so understood there was no error. Under the previous instructions it was left for the jury to say whether, on all of the facts, the septic condition that caused the loss of the leg was due to the fracture, or whether it came from the disease condition for which another physician was treating him. If the defendant was notified of or discovered and recognized the existence of conditions which would have conveyed, or ought to have conveyed, to a physician possessing the skill possessed by physicians in his locality, that a septic condition was developing or was present, and yet failed to take proper measures to counteract, prevent or safeguard the plaintiff against such condition, then the jury would be justified in finding that the defendant was negligent in the treatment of the plaintiff's leg. The evidence warranted a finding that the defendant knew of the condition of the patient, that he was negligent in failing to ascertain that there was a compound fracture and in treating the fracture as a simple one, and that the septic condition resulted from his negligent treatment. Exceptions taken by the defendant to rulings by the trial court were overruled.

Roentgenograms: Admissibility of; When Admission is Not Prejudicial.—Where there is no testimony to identify roentgenograms introduced in evidence as roentgenograms of the injured parts of the body that they are supposed to represent, they are inadmissible without the testimony of the persons who took them. In the present case, however, two roentgenograms were made of the same injured limb. The second roentgenogram, with the exception of some minor particulars, showed the same character of injury as the first roentgenogram, to the admission of which exception was taken. The physician who took the second roentgenogram testified that his experience enabled him to swear that the roentgenogram to which exception was taken was a roentgenogram of the very same limb that was shown in the second roentgenogram, identified by him. According to this witness, the same bones of the human body are differently shaped and constructed in each individual, just as are the faces of such individuals. Moreover, the plaintiff and some of her witnesses testified that the roentgenogram was taken of her limb, that the doctor who took it immediately delivered it to her, and that she preserved it. But if such reasons were not sufficient to remove the objections to the introduction of the roentgenogram to the admission of which exception was taken, its admission could not be considered prejudicially material, since its only purpose was to prove the extent of the plaintiff's injuries, and the testimony was uncontradicted on that issue and no sort of earnest attack was made on the amount of the judgment.—*Consolidated Coach Corporation v. Saunders (Ky.), 17 S. W. (2d) 233.*

Evidence: Drunkenness; Admissibility of Evidence of.—When the defendant has taken the witness stand on his own behalf, evidence to prove that he was drunk when the events concerning which he testified occurred is admissible to enable the jury to determine the weight to be given to his testimony, if for no other purpose. It is well known that a man who is drunk at the time something happens cannot give as clear and as accurate an account of the happening as another man of equal intelligence who saw the same happening and was sober. A man might go to see a circus when he is drunk and a few days later go to see a circus when he is sober. He could give a better account of the second circus than he could of the first, though perhaps he would recall seeing more animals at the first one.—*Tester v. Commonwealth (Ky.) 17 S. W. (2d) 260.*

Malpractice: Limitation of Actions.—In malpractice cases there is difficulty in determining the precise moment when the act or omission which caused the damage took place. The neglectful or unskilful act may occur at some particular moment during months of attendance on the patient, or it may persist and characterize the whole treatment. It would seem advisable, therefore, not to apply the bar of the statute of limitations unless it clearly appears from the complaint that the unskilful or negligent act which caused the injury antedated the action by a period greater than the statutory period of limitations. We think, said the supreme court of Minnesota, that the treatment and employment of a physician should be considered as a whole and that in event of malpractice the statute of limitations begins to run when treatment ceases.—*Schmitt v. Esser (Minn.), 226 N. W. 196.*

Dying Declarations: Admissible Though Made by Signs Only.—The deceased died from a blow on his head. He was conscious and could understand what was said to him, but he could not talk, on account of paralysis that had set in. While he was in that condition, his wife asked him whether he had been hit by a train, and he shook his head. She asked him whether Fred Finley had hit him and whether Jan Simpkins had hit him, and he nodded his head. The evidence of the attending physician and of the wife of the deceased showed that when the deceased thus indicated replies to these questions he was in a dying condition and knew it. The information thus given by the deceased was held to be competent as a dying declaration.—*Simpkins v. Commonwealth (Ky.) 17 S. W. (2d) 245.*

Workmen's Compensation: Freezing of Foot Compensable.—A workman who freezes his foot while performing required work outdoors, with the temperature ranging from 9 to 27 degrees below zero, is entitled to compensation under the Wisconsin Workmen's Compensation Act. The injury clearly grew out of and was incidental to his employment. It makes no difference that the exposure was common to all outdoor employment in that locality in that kind of weather. Previous decisions of the supreme court of Wisconsin with respect to similar situations cannot be reconciled, said the court itself, and the decision as stated is based on "first principles."—*Eagle River Building & Supply Co. v. Peck (Wis.), 225 N. W. 690.*

Society Proceedings

COMING MEETINGS

Alabama, Medical Association of the State of, Montgomery, April 15-18. Dr. D. L. Cannon, 519 Dexter Avenue, Montgomery, Secretary.

American Association of Pathologists and Bacteriologists, New York, April 17-18. Dr. H. T. Karsner, 2085 Adelbert Road, Cleveland, Sec'y.

American Pharmacological Society, Chicago, March 27-29. Dr. E. D. Brown, University of Minnesota, Minneapolis, Secretary.

American Physiological Society, Chicago, March 26-29. Dr. A. C. Redfield, 240 Longwood Avenue, Boston, Secretary.

American Society for Experimental Pathology, Chicago, March 26-29. Dr. Carl V. Weller, University of Michigan, Ann Arbor, Secretary.

American Society of Biological Chemistry, Chicago, March 26-29. Dr. H. B. Lewis, University of Michigan Medical School, Ann Arbor, Sec'y.

Arizona State Medical Association, Phoenix, April 17-19. Dr. D. F. Harbridge, 407 Goodrich Building, Phoenix, Secretary.

Federation of American Societies for Experimental Biology, Chicago, March 26-29. Dr. A. C. Redfield, 240 Longwood Avenue, Boston, Sec'y.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Issues of periodicals are kept on file for a period of five years only. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending, but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American J. Ophthalmology, Chicago

13: 1-100 (Jan.) 1930

Tapetoretinal Degeneration of Central Fundus Region. A. Pillat, Peiping, China.—p. 1.

Homonymous Hemianopia: Primary Sign of Tumors Involving Lateral Part of Transverse Fissure. W. I. Lillie, Rochester, Minn.—p. 13.

Subconjunctival Iridectomy for Glaucoma. L. Post, St. Louis.—p. 21.

Accessory Effects of Correcting Glass by Position Before Ametropic Eye. A. Cowan, Philadelphia.—p. 24.

Impressions of Amsterdam Congress. M. Davidson, New York; E. C. Ellett, Memphis, Tenn., and M. H. Post, St. Louis.—p. 33.

Removal of Lead Shot from Vitreous. G. H. Cross, Chester, Pa.—p. 41.

Gaseous Erosion of Cornea. A. G. Wilde, Jackson, Miss.—p. 44.

Annals of Otol., Rhinol. & Laryngol., St. Louis

38: 869-1208 (Dec.) 1929

Surgical Anatomy of Ethmoidal Labyrinth. H. P. Mosher, Boston.—p. 869.

Pathology and Diagnosis of Ethmoid. R. H. Skillern, Philadelphia.—p. 902.

Conservative Treatment of Ethmoiditis. S. Iglauer, Cincinnati.—p. 908.

Radical Treatment of Ethmoid: Intranasal. R. A. Fenton, Portland, Ore.—p. 913.

Symposium on Ethmoidal Sinusitis: External Radical Approach. R. C. Lynch, New Orleans.—p. 931.

Heredity and Human Biology of Ethmoid. G. H. Parker, Cambridge, Mass.—p. 940.

Recent Advances in Otolaryngology: Medical and Surgical Treatment. L. W. Dean, St. Louis.—p. 952.

Physics and Physiology of Sinuses. A. W. Proetz, St. Louis.—p. 963.

Pathology of Sinusitis. F. B. Kistner, Portland, Ore.—p. 977.

General Surgical Principles Employed in Treatment of Chronic Disease of Nasal Sinuses. E. C. Sewall, San Francisco.—p. 995.

General Principles of Treatment of Nasal Sinus Inflammations. E. R. Lewis, Los Angeles.—p. 1005.

Acute Osteomyelitis of Frontal and Superior Maxillary Bones Complicating Sinusitis: Operation, Apparent Recovery, Sudden Death: Case. R. H. Skillern, Philadelphia.—p. 1022.

Occurrence of Tympanic Hemorrhage Following Radical Operation for Relief of Trigeminal Neuralgia. W. J. Gardner and J. A. Babbitt, Philadelphia.—p. 1040.

Iodized Oil as Aid in Diagnosis of Sinus Disease (Campiodol-Lipiodol). K. M. Houser, Philadelphia.—p. 1052.

Iodized Rapeseed Oil (Campiodol) in Diagnosis of Chronic Maxillary Sinusitis. M. A. Glaser, C. E. Futch and H. Snure, Los Angeles.—p. 1067.

Asthma: Etiology and Surgical Treatment. F. Smith, Grand Rapids, Mich.—p. 1095.

Analysis of Limb Responses to Semicircular Canal Stimulation in Frog. J. Tait and W. J. McNally, Montreal.—p. 1121.

Use of Electrically Heated Bougies in Treatment of Postdiphtheritic Cicatricial Stenosis of Larynx. W. H. Johnston, St. Louis.—p. 1145.

Nonsurgical Treatment of Chronic Middle Ear Suppuration Based on Twenty-Five Years' Experience. J. C. Beck, Chicago.—p. 1150.

Method of Correcting Lax, Baggy Septa Following Submucous Resection. J. A. Pratt, Minneapolis.—p. 1156.

Two Interesting Foreign Body Cases of Mastoid and Nose. E. P. Longaker, Philadelphia.—p. 1158.

Physiology of Ear. W. J. McNally, Montreal.—p. 1163.

Annals of Surgery, Philadelphia

91: 1-160 (Jan.) 1930

Semicentennial Anniversary of Founding of New York Surgical Society. E. Beer, New York.—p. 1.

Influence of New York Surgical Society on Development of Surgery. F. B. Lund, Boston.—p. 3.

Early Days of New York Surgical Society. W. J. Mayo, Rochester, Minn.—p. 13.

Semicentennial Anniversary of New York Surgical Society. E. Eliot, Jr., New York.—p. 21.

*Evaluation of Cardiac and Circulatory Stimulants for Surgical Patients. A. E. Phelps, New York.—p. 24.

*Treatment of Pituitary Tumors: Rôle of Roentgen Ray and of Surgery. E. B. Towne, San Francisco.—p. 29.

*Giant Cell Tumor of Spine. J. V. Santos, Chicago.—p. 37.

Sarcoma of Thyroid Gland: Case. I. Arons, New York.—p. 44.

*Extrapleural Thoracoplasty During Treatment of Pulmonary Tuberculosis. A. V. S. Lambert and F. B. Berry, New York.—p. 57.

*Changes in Intrahepatic Bile Ducts Following Cholecystectomy. J. E. Sutton, Jr., New York.—p. 65.

*Peptic Ulcer: VII. Clinical Corroboration of Experimental Data. C. B. Morton and J. B. Graham, Charlottesville, Va.—p. 73.

Tuberculosis of Sigmoid Colon Simulating Primary Malignant Lesion. J. A. Bargen, M. M. Copeland and F. W. Rankin, Rochester, Minn.—p. 79.

Surgical Management of Stone in Ureter. J. B. Deaver and V. G. Burden, Philadelphia.—p. 85.

*Problems Related to Surgical Lesions of Kidney. V. C. Hunt, Rochester, Minn.—p. 92.

*Ureteropyelonephrostomy for Urinary Obstruction at Ureteropelvic Junction. W. Walters, Rochester, Minn.—p. 101.

Tuberculosis of Prostate Gland. O. S. Lowsley and J. Duff, New York.—p. 106.

Testicular Neoplasms. B. S. Barringer, F. W. Stewart and J. W. Spies, New York.—p. 115.

*Kaolin in Treatment of External Gastro-Intestinal Fistulas. F. C. Tui, New York.—p. 123.

Evaluation of Cardiac and Circulatory Stimulants for Surgical Patients.—The relative values of the drugs commonly employed as cardiac and circulatory stimulants in surgical shock are discussed by Phelps. He says that epinephrine increases the cardiac output for a brief period (less than seven minutes), with a tendency in many instances to a return to a point below the original output. Caffeine actually diminishes the cardiac output. Camphor-in-oil depresses the cardiac musculature and dilates the coronary vessels. Ephedrine stimulates the accelerator mechanism; large doses depress the heart muscle and cause a fall in blood pressure. Solution of pituitary constricts the vessels in general but dilates the heart to a very high degree immediately after its administration. Strychnine has no tonic effect on the heart. The use of insulin in shock is harmful. Digitalis, in adequate dosage, is a cardiac tonic and a general vasoconstrictor, the action of which is dependable, pronounced and sustained.

Treatment of Pituitary Tumors: Rôle of Roentgen Ray and of Surgery.—Five cases are reported by Towne which illustrate long-standing favorable results from roentgen treatment, and show that if the result is not good, a cystic tumor, favorable for surgery, may be diagnosed. He believes that the present custom of following surgery immediately with roentgen treatment confuses the issue. The two methods may be used separately without jeopardizing the patient's chance for a cure. He proposes that all pituitary adenomas be treated by roentgen rays under the observation of the ophthalmologist and the neurosurgeon; that the treatment be stopped as soon as improvement begins, and that surgery be undertaken short of six months only when visual acuity and fields recede under roentgen treatment.

Giant Cell Tumor of Spine.—To the twenty-three cases of primary giant cell tumor of the vertebra recorded in the literature Santos adds one case in which the seat of the tumor was the body of the first lumbar vertebrae.

Extrapleural Thoracoplasty During Treatment of Pulmonary Tuberculosis.—Lambert and Berry believe that the thoracoplastic operation should be done in two or more stages, and that it is hazardous to remove all the ribs at one stage. They usually remove from 10 to 12 cm. of the lower ribs and a gradually diminishing amount as they proceed upward. From 1 to 2 cm. is removed from the first rib. As these wounds are of wide extent, and a dead space necessarily remains beneath the large flap, a careful hemostasis should be carried out, and every vessel which may require a hemostat should be ligated. They drain the dead space beneath the flap with the empty cover of a cigaret drain, which is removed at the first dressing on the third or fourth postoperative day. They divide the phrenic nerve as a preliminary step to the procedure and have come to believe that this is the proper sequence. A more gradual collapse of the lung can thus be obtained and valuable information gained as to whether the patient will be benefited by a more extensive collapse. The condition of the contralateral lung is of vital importance and it is extremely difficult to form a correct estimate of the significance of the roentgen evidence of former disease. Of the twenty-four operative deaths in their series, sixteen were in patients with bilateral lesions

and seven of these were due to an immediate spread or reactivation of the disease in the contralateral lung, while there was only one such case among eight operative deaths in the unilateral group. They think that an important factor in promoting this reactivation of what was often considered a quiescent or healed lesion is a tuberculin reaction. The release in the circulation of a certain amount of tuberculin from the manipulation and sudden collapse of an extensive lesion is frequently the cause of a sharp, sudden postoperative rise in temperature. Any case in which there is distinct evidence of disease on the opposite side has a poor prognosis whether the lesion seems to be quiescent or not. The choice of an anesthetic is of great importance. The authors have employed nitrous oxide and oxygen, ethylene and oxygen, local anesthesia, and spinal anesthesia. Nitrous oxide if well borne is an excellent anesthetic but there are patients who take it badly, showing a pronounced cyanosis accompanied by marked inspiratory dyspnea, which places a great burden on the right side of the heart. Many of these patients have been leading a sedentary life; their heart muscle has lost much of its normal tone, and is flabby. This burden on the heart may result in a dilatation with serious consequences. The authors have not noted ill effects from ethylene. Of 100 patients twenty-three with unilateral involvement were cured; sixteen were improved; four with bilateral involvement were cured, and five were improved.

Changes in Intrahepatic Bile Ducts Following Cholecystectomy.—Sutton states that experimental study on the dog has shown that cholecystectomy deprives the dog of a useful organ and the closely related bile duct epithelium undergoes changes of adaptation to assume the functions normally performed by the gallbladder.

Clinical Corroboration of Experimental Data in Peptic Ulcer.—A case is reported by Morton and Graham the history of which had led to an operation for cholecystic disease. The appendix and gallbladder were excised, multiple stones were removed from the common bile duct and choledochostomy was performed. There was no palpable or visible evidence of ulceration of the stomach or duodenum at that time. The patient died twenty-four days after operation of an acute hemorrhage from a large duodenal ulcer which was discovered at necropsy. An additional gallstone was found to have obstructed the lumen of the common bile duct completely and a pancreatic stone was partially obstructing the main pancreatic duct. The formation of the ulcer was attributed to interference with the discharge of alkaline pancreatic juice and bile into the duodenum. Attention is called to the formation of identically similar ulcers in dogs following surgical duodenal drainage, an experimental procedure which diverts the pancreatic juice and bile from the region of the pylorus. It is suggested that the observations in the case reported presented corroborative evidence in favor of the applicability of one of the authors' (Morton) previously reported experimental data to the clinical problem of the etiology of peptic ulcer.

Problems Related to Surgical Lesions of Kidney.—In Hunt's opinion an operable tumor of the kidney, in the absence of contraindications, always is a surgical condition and good results are dependent on early diagnosis and early operation.

Ureteropyelonephrostomy for Urinary Obstruction at Ureteropelvic Junction.—The value of plastic procedures on the kidney, pelvis and ureter from which the urinary outflow is obstructed is emphasized by Walters in two cases of ureteropyelonephrostomy, in one of which the operation was one of necessity and was life-saving, in view of the fact that the obstruction at the ureteropelvic juncture was complete and the kidney was solitary. Infection in the kidney operated on does not seem to complicate surgical results. Subsequent to operation the degree of infection of the kidneys is diminished and the function of the kidney improved.

Kaolin in Treatment of External Gastro-Intestinal Fistulas.—Kaolin is recommended by Tui as a dressing in cases of external gastro-intestinal fistula. It need not be made into a paste. The powder is simpler, more soothing and more absorbent and absorptive. It is not necessary to sterilize it. It should not be used in the quantities of an ordinary dusting powder, but applied liberally. It prevents irritation and digestion of the wound by the discharge, relieves burning and smarting and insures prompt and uninterrupted healing. The use of petrolatum and other oleaginous substances in Tui's opinion is harmful.

Archives of Internal Medicine, Chicago

45: 1-160 (Jan.) 1930

*Beriberi Heart. C. S. Keefer, Peiping, China.—p. 1.
*Chronic Glomerulonephritis with Lipoid Changes. F. D. Murphy, Milwaukee.—p. 23.
*Hemochromatosis: Case. E. H. Funk and H. St. Clair, Philadelphia. —p. 37.
*Comparison of Blood Supply of Right and Left Ventricles in Childhood. M. B. Whitten, Rochester, Minn.—p. 46.
*Complete Heart Block. J. M. Read, San Francisco.—p. 59.
*Treatment of Pneumonia by Inhalation of Carbon Dioxide: I. Relief of Atelectasis. Y. Henderson and H. W. Haggard, New Haven, Conn.; P. N. Corylios and G. L. Birnbaum, New York.—p. 72.
Atelectasis in Pathogenesis of Abscess of Lung. T. S. Moise and A. H. Smith, New Haven, Conn.—p. 92.
*Treatment of Acute Epidemic Poliomyelitis by Intrathecal Administration of Ephedrine. M. B. Brahdy and I. H. Scheffer, New York.—p. 102.
*Effect of Hypnosis on Basal Metabolism. J. Goldwyn, Worcester, Mass. —p. 109.
Effect of Lessened Respiratory Reserve on Blood and on Circulation. W. S. Lemon, Rochester, Minn.—p. 115.
*Exophthalmic Goiter. W. O. Thompson and B. Alexander, Boston.—p. 122.
Basal Metabolic Rate in Relation to Menstrual Cycle. C. J. Conklin and J. F. McClendon, Minneapolis.—p. 125.
*Calcium Metabolism in Arthritis. E. F. F. Copp, La Jolla, Calif.—p. 136.
*Peripheral Surface Temperature in Arthritis. L. M. Wright and R. Pemberton, Philadelphia.—p. 147.

Beriberi Heart.—A group of twenty-seven patients with beriberi were studied by Keefer with particular reference to the cardiovascular system. It was clearly demonstrated that the patients who develop cardiac insufficiency are those who have the least involvement of the nervous system. The hypotheses that have been advanced in explanation of the mechanism of heart failure in this disease are reviewed and the mechanism is discussed. The importance of diet and exercise in the management of heart disease is emphasized.

Chronic Glomerulonephritis with Lipoid Changes.—A patient, aged 12 years, with chronic glomerulonephritis and lipoid changes in the various organs was observed by Murphy from the onset of the disease until death five years later. During the course of the disease the symptoms were evanescent and varied so much from time to time that the proper interpretation of the clinical picture was difficult in some stages of the disease. Lipoid deposits in the various parenchymatous organs are described, and their relationship to hypercholesterolemia is discussed. The atherosclerosis of the aorta and mitral valve is described and its dependence on hypercholesterolemia is pointed out. A description is given of the changes found in the arteries and arterioles of the kidney and other parenchymatous organs as well as those found in the skeletal muscles. The injury found in the renal arterioles is especially dwelt on.

Hemochromatosis.—A case of hemochromatosis without diabetes is reported by Funk and St. Clair. The copper content of the liver was found to be 140 mg. per kilogram of fresh tissue, or 331.8 mg. for the entire organ. The copper content of the spleen was found to be less than 1 mg. for the entire organ. The estimated quantity of iron in the liver is probably inaccurate but was found to be at least 6.2 Gm. per kilogram of tissue, or 14.7 Gm. for the entire organ. No analyses were made for zinc, manganese, nickel or other heavy metals. The authors are of the opinion that increased hemolysis is not the cause of the iron pigmentation, and that the rôle played by copper is secondary to an unknown etiologic agent.

Comparison of Blood Supply of Right and Left Ventricles in Childhood.—A method of demonstrating the circulation of the interventricular and interauricular septums by a modification of the celluloid corrosion technic is described by Whitten. He found that at birth and during the latter part of fetal life, the right and left ventricles are about equal in vascularity. By the end of the second year, the left ventricle has become definitely more vascular than the right. This preponderance increases until about the tenth year of life, after which no increase in the vascular preponderance of the left ventricle can be demonstrated. There is a definite preponderance

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of the venous circulation in the left ventricle as compared with that of the right. It is suggested that there is some relationship between the thickness of the ventricular wall and its blood supply in the absence of marked arteriosclerosis.

Complete Heart Block.—Two patients with long-standing, complete heart block were studied by Read with a view to obtaining further clinical evidence of the mechanism by which they maintained an adequate circulation with a pulse rate below 50. Increased size of the heart and wide pulse pressure with normal diastolic blood pressure were noted, as well as wide amplitude of movement of the ventricular border. Variability of stroke volume was surmised because of: (1) inequality of the first heart sound at successive systoles, (2) variable heights of systolic pressure and (3) the different shape of the roentgen-kymographic curves produced by ventricular systole. This variability seems to be due to the fact that different numbers of auricular systoles occur during ventricular diastole, and a more important rôle in filling the ventricle is attributed to auricular systole than it is customary to assign to it.

Treatment of Pneumonia by Inhalation of Carbon Dioxide.—As the background for this study, the following facts are cited by Henderson et al.: (*a*) If the lungs are not fully distended soon after birth, pneumonia is likely to develop. (*b*) After surgical operations, massive, lobar or lobular atelectasis of the lung is a rather frequent occurrence, and is the condition from which postoperative pneumonia develops. This atelectasis or, better, apneumatosis is prevented and relieved, and the risk of pneumonia is eliminated, by the inhalation of carbon dioxide. (*c*) The inhalation of 5 per cent carbon dioxide in oxygen, which is now the standard treatment for carbon monoxide asphyxia, is also an effective preventive of postasphyxial pneumonia. (*d*) In pneumonia it is the blocking of the lung airways, bronchi or bronchioli by plugs of thick and sticky secretion which is the critical morbidic factor producing atelectasis and the conditions characteristic of an undrained infection. The experiments here reported demonstrate these facts: (*a*) Atelectasis that is induced experimentally in dogs by blocking a bronchus is quickly cleared up and the lung is redistended by the deep breathing induced by inhalation of carbon dioxide in proper dilution. (*b*) Pneumonia that is induced in dogs by insufflation of a virulent culture of pneumococci is generally overcome, the lung is redistended and the animal is restored to health by inhalation of carbon dioxide sufficient to cause deep breathing and continued until the pneumonic area is cleared. Success with this therapy for the relief of pneumonia in patients depends on administering the inhalation as early as possible. If medical pneumonia is thus treated early enough, it appears probable that the results may be as effective as those which have already been attained in postoperative and postasphyxial pneumonia.

Treatment of Acute Epidemic Poliomyelitis by Intrathecal Administration of Ephedrine.—Ephedrine was given intrathecally by Brahdy and Scheffer in ten cases. On admission, the patients were classified as severely ill with a poor prognosis for life. When ephedrine was administered, the last 2 to 4 cc. of spinal fluid was retained in the gravity tube. From 40 to 60 mg. of an ephedrine salt in 1 cc. of sterile water was added to the spinal fluid and permitted to gravitate into the spinal canal. The average dilution was 50 mg. of drug in 5 cc. of fluid, or a concentration of about 1 per cent. In severe cases, it may be advisable to give two or more daily injections during the first few days. Five of the ten died, a mortality of 50 per cent. Among a control group of nineteen cases, seven moderate and twelve severe, nine of the twelve patients with severe involvement died, a mortality of 75 per cent as compared with a mortality of 50 per cent among the patients who were treated with ephedrine. The authors feel that their patients were benefited and that the mortality was reduced by the use of ephedrine.

Effect of Hypnosis on Basal Metabolism.—The basal metabolism, pulse, respiration, blood count and chemical analysis of the blood of eighteen normal subjects were studied both in the waking state and in the hypnotic state. In every case Goldwyn found that the basal metabolism was decreased under hypnotic suggestions tending to produce mental and physical inactivity. The decreases varied from 0.6 to 8.3 per cent, with an average decrease of 3.88 per cent. There was a tendency for the pulse and respiration to be lower under hypnosis. The blood pressure, blood count and chemical analysis of the blood showed no constant change under hypnosis.

Exophthalmic Goiter.—In one patient whose thyroid gland was apparently functioning normally, Thompson and Alexander were able to observe the effect of the administration of thyroid on the concentration of protein in the spinal fluid. A well marked increase in basal metabolism during its administration was associated with a well marked decrease in the concentration of protein.

Calcium Metabolism in Arthritis.—The daily calcium metabolism in two cases of toxic arthritis was studied by Copp for many weeks. A retention of calcium was found in a patient with hypertrophic osteoarthritis. A loss of calcium or a negative calcium balance existed in a patient with atrophic osteoarthritis.

Peripheral Surface Temperature in Arthritis.—Observations made by Wright and Pemberton lend further support to the evidence already advanced that an important part of the phenomena of arthritis and the rheumatoid syndrome is referable to disturbances in the peripheral blood flow.

Archives of Pathology, Chicago

9: 1-146 (Jan.) 1930. Part I

Immunologic Aspects of Sexual Cycle: I. Anaphylactic Studies with Mammalian Follicular Fluid. W. R. Lyons and F. R. Van de Carr, San Francisco.—p. 1.
*Primary Carcinoma of Ureter: Case. R. D'Aunoy and A. Zoeller, New Orleans.—p. 17.
*Testicular Tubular Adenoma of Ovary. N. W. Popoff, Rochester, N. Y. —p. 31.
Detorsion Defects in Congenital Cardiac Anomalies. P. F. Shapiro, Chicago.—p. 54.
Handy Double-Purpose Hematocrit. O. B. Pratt and H. O. Swartout, Los Angeles.—p. 69.
Intracellular Symbionts and Rickettsiae. R. W. Glaser, Princeton, N. J. —p. 71.

9: 147-444 (Jan.) 1930. Part II

Skin Reactions, Blood Chemistry and Physical Status of Normal Men and of Clinical Patients. W. F. Petersen and S. A. Levinson, Chicago. —p. 147.

Primary Carcinoma of Ureter.—A case of primary carcinoma of the ureter is reported by D'Aunoy and Zoeller, with a summary of the salient features of the forty-eight cases recorded in the medical literature. Twenty-eight of the recorded tumors were papillary; twenty were nonpapillary. The incidence is about equal for the two sexes, with the greatest number occurring during the sixth and seventh decades of life. The lower part of the ureter is more frequently the site of the lesion. No etiology can be ascribed, although concurrent lithiasis was present in six cases. The consensus seems to be that so-called benign papillomas of the ureter and of other parts of the urinary tract must always be regarded as highly suspicious growths so far as actual, as well as potential, malignancy is concerned.

Testicular Tubular Adenoma of Ovary.—Popoff reports a case of tubular testicular adenoma of the ovary which occurred in a woman free from any signs of hermaphrodism. He feels that embryologic considerations, zoologic observations and experimental data give every preference to the term sex reversal or intersexuality rather than to the meaningless term hermaphrodism which is generally used now.

Archives of Surgery, Chicago

20: 1-174 (Jan.) 1930

*Effects of Certain Operations on Esophagus of Dog. W. D. Andrus and J. L. Donnelly, Cincinnati.—p. 1.
Liver Autolysis in Vivo. J. C. Ellis and L. R. Dragstedt, Chicago.—p. 8.
*Bilirubin in Effusions of Joints. D. H. Kling, Los Angeles.—p. 17.
Distribution of Blood in Shock. A. Blalock and H. Bradburn, Nashville, Tenn.—p. 26.
Primary Intramuscular Hemangiomas of Striated Muscle. J. S. Davis and E. A. Kitlowski, Baltimore.—p. 39.
*Operative Surgery of Hip Joint. A. P. C. Ashhurst, Philadelphia.—p. 87.
Spinal Cord Injury. G. G. Davis and H. C. Voris, Chicago.—p. 145.
Focal Infection in Spondylitis Deformans. I. W. Nachlas, Baltimore. —p. 159.

Effects of Certain Operations on Esophagus of Dog.—The striking result of the experiments made by Andrus and Donnelly is that dogs invariably die following the sudden and

complete obstruction of the esophagus; also, the production of an esophageal fistula without the subsequent administration of fluids was invariably followed by death in the animals of this series. The cause of death in these animals is not clear. Dehydration, while it may play a rôle, is not the sole agent, as evidenced by the fact that animals can live for thirty days or more when food and water are entirely withheld. Further, animals dying from esophageal obstruction do not exhibit the terminal rise in temperature usually seen in animals dying from dehydration. The studies of the changes in the chemical composition of the blood in this series indicate a tendency toward a decrease in the carbon dioxide combining power of the plasma and in the chlorides of the blood in some animals, but these changes are not constant. The blood urea nitrogen showed a terminal rise in a few instances. The average duration of life following the production of esophageal fistula and without the administration of fluids was seventy-three hours, one animal living for six days. The authors have not been able to increase materially the duration of life in animals with esophageal obstruction by the administration of sodium chloride, or of sodium chloride and sodium bicarbonate. The fact that animals with esophageal fistulas die in almost as short a time as those with esophageal obstruction, and apparently in a similar manner, suggests that the loss of saliva may play an important rôle in the lethal outcome.

Bilirubin in Effusions of Joints.—Kling's study of the icterus index brought forward fundamental differences in the bilirubin contents of joint effusions. The local formation of bilirubin raises the icterus index in traumatic, hemorrhagic effusions above the level of the blood serum. The icterus index in inflammatory effusions, on the other hand, is equal or slightly lower than in blood serum. The locally formed bilirubin content depends on the amount of bleeding and on the time allowed for production. The icterus index therefore will increase and the blood corpuscles decrease in traumatic effusion. This permits one to draw a conclusion as to the age of an effusion, and to distinguish between a hemorrhage due to puncture during aspiration and an original hematoma. The icterus index in inflammatory effusions is not influenced by these factors, nor does it vary on reaspiration. In intra-articular fractures, venous blood, rich in bilirubin, reaches the joint cavity from the bone marrow, and raises the icterus index immediately, independent of any local formation of bilirubin. A high icterus index in a fluid aspirated immediately, or in the first days after the trauma, is characteristic of intra-articular fractures. The amount of blood corpuscles in an effusion can be estimated by the volume of the blood sediment or directly by the cell count, and compared with the value in the circulating blood.

Operative Surgery of Hip Joint.—Ashhurst discusses: (1) the indications for the various operative procedures, (2) the technic of the operations and (3) the results.

Colorado Medicine, Denver

27: 1-30 (Jan.) 1930

Growth and Spread of Carcinoma. H. E. Robertson, Rochester, Minn.—p. 4.
Physical and Mental Handicaps in Girls Entering University of Colorado. F. W. Muenzinger, Boulder.—p. 8.
Physician's Liability Insurance. P. M. Clark, Denver.—p. 13.

Illinois Medical Journal, Oak Park

57: 1-72 (Jan.) 1930

Losing Liberty Judicially. C. B. Reed, Chicago.—p. 13.
Recent Advances and Present Status of Treatment of Syphilis of Nervous System. L. D. Cady, St. Louis.—p. 19.
Scarlet Fever. G. Dick, Chicago.—p. 22.
Small and Large Quantities of Radium in Treatment of Malignancy of Mucous Membranes. F. E. Simpson and R. E. Flesher, Chicago.—p. 26.
Preradium Treatment of Uterine Cervical Malignancy. H. Swanberg, Quincy.—p. 26.
*Masked Tubercle. W. R. Abbott, Chicago.—p. 31.
Place of Practicing Physician in School Hygiene. E. R. Harrington, Springfield.—p. 37.
Pathology of Hernia Following Cataract Operation. O. B. Nugent, Chicago.—p. 41.
Gradenigo's Syndrome. G. Woodruff, Joliet.—p. 44.
Roentgen Ray in Differential Diagnosis of Bile Tract Disease. D. S. Beilin, Chicago.—p. 45.
What Must Be Done and What Must Be Contended With. J. L. Webb, Chicago.—p. 47.
Reaction of Laity to Progress of Medicine. M. L. Etheredge, Urbana.—p. 52.
*Observations from Children's Cardiac Clinic. P. Rosenblum, Chicago.—p. 54.
Diarrheas of Infancy. J. R. Gerstley, Chicago.—p. 56.
*Contribution of Student Health Service to Progress of Modern Medicine. J. H. Beard, Urbana.—p. 58.
*Lactic Acid Milk in Infant Feeding. A. L. Lash, Chicago.—p. 61.
Carcinoma of Duodenum: Case. J. S. Archibald, Decatur.—p. 62.
Natural Defensive Power of Body Against Disease. L. Arnold, Chicago.—p. 65.

Masked Tubercle.—Abbott summarizes his paper as follows: The masked tubercle represents a glandular tuberculosis, which is not necessarily confirmed by physical signs but should be suspected from the clinical symptoms. If these symptoms appear in a subject who has been exposed to prolonged and intimate contact, the surmise that they are due to an active tuberculous process will be right four times out of five. Obscurity of diagnosis may be clarified by tuberculin inoculations. The prevention of pulmonary tuberculosis rests on the recognition of this preminimal state and the institution of proper treatment to bring about its arrest and cure. Before fixing on the diagnosis of masked tubercle the following conditions should be differentiated: postinfluenzal catarrhal infections of the respiratory tract; focal infections of the head, neck, and mediastinum; mitral stenosis; pyelitis, and hyperthyroidism.

Observations from Children's Cardiac Clinic.—Rosenblum emphasizes (1) the necessity of repeated early examinations of children from birth, and after all acute infections; (2) the advisability of prolonged rest and convalescence for any cardiac involvement, followed by graduated exercises before a return to the usual activity, and (3) the early and complete removal of all diseased tonsils and adenoids, with the proper and adequate treatment of all other foci of infection, in children showing any cardiac involvement.

Contribution of Student Health Service to Progress of Modern Medicine.—Beard says that it is not the purpose of health services to pauperize or paternalize students or to socialize medicine but they do covet opportunities to do their part in putting the college graduate and the physician shoulder to shoulder to mutual advantage in serving the public, in advancing modern medicine and in making a better world.

Lactic Acid Milk in Infant Feeding.—Lash reports on 240 cases of marasmic or atrophic children, below weight infants, and babies that did not do well on ordinary milk mixtures, to whom he gave lactic acid milk with most gratifying results.

Kentucky M. Journal, Bowling Green

28: 1-46 (Jan.) 1930

Hyperthyroidism in Children. H. Newman, Bowling Green.—p. 6.
Care of Epileptic by Family Doctor. F. M. Stites, Hopkinsville.—p. 9.
Nontuberculous Pulmonary Hemorrhage. O. O. Miller, Louisville.—p. 13.
Pancreatic Cyst: Operation: Recovery: Case. M. Casper, Louisville.—p. 15.
Cure of Complete Adult Rectal Prolapse by Submucous and Perirectal Injections. W. E. Applehaus, Louisville.—p. 16.
Fracture of Right Optic Foramen: Amaurosis. S. G. Dabney, Louisville.—p. 19.
Spinal Anesthesia. H. E. Richey, Louisville.—p. 22.
Infective Emboli with Purpura and Spontaneous Amputation of Toes: Case. J. G. Sherrill, Louisville.—p. 33.
Management of Diabetes. F. M. Stites, Jr., Louisville.—p. 35.

Medical Journal & Record, New York

131: 1-60 (Jan. 1) 1930

America Practices Medicine. G. F. Chandler, Kingston, N. Y.—p. 1.
How to Be Helpful to Patients. M. Einhorn, New York.—p. 4.
Toxic Encephalitis in Bacillus Pyocyaneus Septicemia. R. S. Leadingham, Atlanta, Ga.—p. 5.
Undulant Fever of Pseudotuberculous Type and Pulmonary Tuberculosis. L. V. Schneider, State Sanitorium, Md.—p. 7.
Spasm of Sigmoid, Simulating Carcinoma. S. Ehrlich, New York.—p. 9.
New Technic for Diagnosis and Definition of Anorectal Fistulas. J. F. Montague, New York.—p. 12.
Diet in Treatment of Tuberculosis. O. Weinshank, Olive View Sanatorium, Calif.—p. 14.
Developmental Diseases of Bones. S. W. Boorstein, New York.—p. 17.
Chronic Mucous Gastritis with Loss of Appetite in Children. C. G. Kerley, New York.—p. 23.
Abdominal Distention as Complication of Pneumonia in Infants. H. P. Fine, Perth Amboy, N. J.—p. 25.
Child in Rheumatic Melée. J. Epstein, New York.—p. 26.

Acute Pyelitis in Infancy Treated with Pituitary Extract: Case. N. Ginsberg, Long Beach, N. Y.—p. 28.
Control Methods in Diphtheria Prevention. D. M. Lewis, New Haven, Conn.—p. 29.
Differential Diagnosis Between Diphtheria and Oral Lesions of Blood Dyscrasias. M. B. Gordon and A. M. Litvak, New York.—p. 35.

131: 61-120 (Jan. 15) 1930

Tendencies in Health and Preventive Medical Services. D. B. Armstrong, New York.—p. 61.
Diseases of Prostate and Treatment. M. B. Wesson, San Francisco.—p. 64.
How to Catch Cold. E. H. Griffin, New York.—p. 67.
Granuloma Inguinale. F. S. Mainzer, Clearfield, Pa.—p. 70.
*Iodophilia in Diagnosis of Malignancy. N. Alpert, Baltimore.—p. 72.
*Differential Diagnosis Between Diphtheria and Oral Lesions of Blood Dyscrasias. M. B. Gordon and A. M. Litvak, New York.—p. 74.
Developmental Diseases of Bones. S. W. Boorstein, New York.—p. 77.
Vincent's Angina. J. C. Seal, New York.—p. 81.
*Infection with Bacillus Aerogenes-Capsulatus: Case. J. B. Wolffe, Philadelphia.—p. 82.
Occurrence of Voluminous Hernia and Management. M. Thorek, Chicago.—p. 83.
Relief of Inguinal Hernia Without Operation. F. S. Jameson and J. Cantala, New York.—p. 87.
Hernia Treated by Subcutaneous Injections. I. Mayer, Detroit.—p. 90.
Hernia and Bearings on Industrial Claims and Liability Insurance. F. H. Seeley, Chicago.—p. 93.
Operation for Cure of Hernia. G. A. Hendon, Louisville, Ky.—p. 94.
Diagnosis of Diaphragmatic Hernia. L. F. Watson, Los Angeles.—p. 95.
Is Operation for Hernia Proving to Be a Success or a Failure? G. M. Randall, Chicago.—p. 96.

Iodophilia in Diagnosis of Malignant Disease.—Alpert reports two cases to demonstrate the importance of iodophilia as an aid in the diagnosis of malignant tumors. He says that the iodophilic reaction, in which brownish granules or staining is found in polymorphonuclear leukocytes on being tested with iodine solution, is constantly found in the blood in cases of malignant tumors, as well as in suppurative conditions, leukemia and Addison's disease. When a malignant condition is suspected, and other conditions can be ruled out, the iodophilic reaction is of diagnostic value.

Differential Diagnosis Between Diphtheria and Oral Lesions of Blood Dyscrasias.—Gordon and Litvak present a differential diagnostic table for diphtheria and the oral lesions of agranulocytic angina, acute lymphatic leukemia, myelogenous leukemia and aleukemic leukemia, together with brief clinical descriptions and case reports. They state that a complete blood study is indicated in every case of suspected diphtheria in the presence of any of the following: (1) persistence of membrane after the administration of diphtheria antitoxin; (2) lesions in the mouth other than on the tonsils; (3) cutaneous and mucous membrane hemorrhages; (4) marked pallor; (5) general glandular enlargement; (6) enlargement of the spleen.

Infection with Bacillus Aerogenes-Capsulatus.—Wolffe reports a case of bronchopneumonia caused by *Bacillus welchii*. The organism was found in the stools. The treatment consisted in the intramuscular administration of 350 cc. of perfringens antitoxin in 50 cc. doses. Other treatment was symptomatic. Within twenty-four hours after specific serum therapy was instituted, a definite change for the better occurred and improvement was progressive, except for serum reactions in the form of joint involvement and urticaria. The diagnosis was based on a pneumothorax apparently spontaneously absorbed; a migrating pneumonitis without cough or expectoration; the marked toxemia of the patient, and the almost miraculous response to specific serum therapy.

Medicine, Baltimore

8: 419-471 (Dec.) 1929

Therapeutic Value of Radiation. E. M. L. Clausen, Baltimore.—p. 419.

Michigan State M. Soc. Journal, Grand Rapids

29: 1-82 (Jan.) 1930

Feeding and Nutritional Disorders of Infancy. J. H. Hess, Chicago.—p. 1.
Victor C. Vaughan: An Appreciation. C. B. Burr, Flint.—p. 7.
Animal Experimentation Regarding Thymic Disturbance: Review of Literature. C. A. Smith, Ann Arbor.—p. 11.
Clinical Aspects of Diseases of Thymus Gland in Childhood. W. C. C. Cole, Detroit.—p. 16.
Present Concepts of Enlarged Thymus and Status Thymicolymphaticus. M. Cooperstock, Ann Arbor.—p. 21.
Cin-Ex Camera Studies of Thymus in Infants and Children. C. K. Hasley and R. Q. DeTomasi, Detroit.—p. 25.
Use of Roentgen Ray in Treatment and Diagnosis of Enlarged Thymus. S. W. Donaldson and J. M. Barnes, Ann Arbor.—p. 29.
Doctor's Log. W. J. Stapleton, Jr., Detroit.—p. 37.
Interrelationship Between Dermatoses and Internal Diseases. R. C. Jamieson, Detroit.—p. 45.

Military Surgeon, Washington, D. C.

66: 1-164 (Jan.) 1930

*Heliotherapy in Treatment of Tuberculosis. E. H. Bruns.—p. 1.
Edward Jenner and Discovery of Smallpox Vaccination. L. H. Roddis.—p. 6.
Vesical Calculus Formed Around Chewing Gum: Needle in Rectum. J. S. Gibson.—p. 33.
Ascent of Piapayungan. L. L. Gardner.—p. 35.
Investigation of Outbreak of Suspected Human Anthrax. G. F. Lull, F. H. K. Reynolds and J. Sian.—p. 54.
Common Cardiovascular Renal Problems: Diagnosis and Treatment of Types Occurring in Military Service. T. W. Burnett.—p. 59.
Medical Reserve Officers' Inactive Training Unit at Mayo Foundation, Rochester, Minn. J. B. Mason.—p. 77.
Munro's Diseases of Army. J. B. Mason.—p. 83.

Heliotherapy in Treatment of Tuberculosis.—Bruns says that the care of tuberculous soldiers as established by Colonel Bushnell more than twenty years ago has undergone few changes. No specific treatment has ever been used; no fads or any of the much exploited so-called cures have ever been introduced. It has not been a treatment by drugs or serums aimed at the direct destruction of the tubercle bacillus but an effort to restore the failing resistance of the body by rest, open air and nourishing food. It has withstood the test of time.

Missouri State M. Assn. Journal, Fulton

27: 1-54 (Jan.) 1930

*Fetal Liver Feeding in Aplastic Anemia: Case. J. H. J. Upham and G. I. Nelson, Columbus, Ohio.—p. 1.
Uterine Curettage. D. A. Robnett, Columbia.—p. 5.
*Laryngeal Tuberculosis. E. E. Glenn and B. J. McGinnis, Mount Vernon.—p. 7.
Juvenile Type of Tuberculosis. H. E. Kleinschmidt, New York.—p. 10.
Early Diagnosis of Tuberculosis in Children. R. S. Battersby, Columbia.—p. 15.
Greatest Problem of Internist. L. Clendening, Kansas City.—p. 16.
Diagnosis and Treatment of Maxillary Sinusitis. O. S. Gilliland, Kansas City.—p. 19.
Gonococcal Disease: Nature and Problems. M. Goldman, Kansas City.—p. 23.
Acromegaly Seventeen Years After Operation by Endonasal Route: Case. L. H. Behrens, St. Louis.—p. 32.
Giardiasis and Pellagra. T. L. Finley, St. Louis.—p. 34.

Fetal Liver Feeding in Aplastic Anemia.—Upham and Nelson report a case of primary aplastic anemia that has been under continuous observation for two years. The patient, aged 21, was born in the Philippine Islands. He was a senior in college. Blood transfusions and liver diet failing to check the progress of the disease, the patient was given cooked fetal calf's liver in daily portions of 250 Gm. There was no noticeable beneficial effect. Then it was given raw, 400 Gm. daily. There was an almost immediate diminution in the amount of bleeding and a consequent lengthening in the transfusion periods. After the second transfusion following the beginning of the raw fetal liver diet, there was an immediate drop in the red blood cell count and hemoglobin. The patient then seemed to be able to maintain this count though at a very low level. The most striking clinical occurrence was the almost complete cessation of the bleeding. In fact, the only bleeding that did occur was the result of slight traumas, such as brushing the teeth or biting on a piece of hard food. The dosage was then raised to 600 Gm. daily, to 800 Gm. and later to 1,000 Gm. daily without any noticeable effect on the hematopoiesis. He did, however, develop a gastro-intestinal upset characterized by diarrhea, anorexia and a slight increase in temperature. Furthermore, with the 1,000 Gm. of liver daily he was unable to take what was considered an adequate diet in the form of fruits and vegetables. The liver feeding was therefore reduced to 800 Gm. daily. The clinical changes which have occurred following the institution of massive doses of raw fetal liver have been: (1) the marked diminution of purpuric manifestations; (2) the rise in the percentage of reticulocytes from an almost negligible quantity to 10 per cent and then a drop to between 1.1 and 3.8 per cent,

where it has remained; (3) the appearance of stippled cells, polychromatophilia and, very rarely, a nucleated red blood cell; (4) the ability to maintain the red blood cell count and hemoglobin at higher levels following each transfusion; (5) an increase in white blood cells from 1,200 to 6,000, although the proportion of lymphocytes is still slightly more than 50 per cent; (6) a diminution in the bleeding time. There has not been a corresponding increase in the blood platelets. The bleeding time varies from two and a half to eight minutes, tending toward the upper limit of normal. The coagulation time is four and a half minutes and the capillary resistance test is still positive.

Laryngeal Tuberculosis.—The water cooled mercury quartz lamp with a laryngeal applicator has been used by Glenn and McGinnis in the treatment of seventy-seven cases of laryngeal tuberculosis. In 89.6 per cent of the cases improvement or apparent arrest was noted. Practically uniform relief from pain and dysphagia has been given by the treatment. The authors feel that this is the most effective method of applying ultraviolet rays to tuberculous lesions of the larynx and that the treatment is justified if for no other reason than that it affords symptomatic relief.

New Orleans M. & Surg. Journal

82: 409-498 (Jan.) 1930

Thoracic Pains. A. E. Fossier, New Orleans.—p. 409.
Mechanism of Production of Thoracic Distress. G. Herrmann, New Orleans.—p. 414.
Diagnosis and Treatment of Acute and Chronic Ileocolitis in Infants and Childhood. J. E. Green, Richton, Miss.—p. 426.
Alimentary Anemia in Infants and Treatment. C. Lorio, Baton Rouge, La.—p. 432.
Gas Anesthesia in Oral, Laryngeal, Lung and Ocular Surgery. A. Caine, New Orleans.—p. 437.
Place of Ethylene Anesthesia. J. T. Nix, New Orleans.—p. 439.
Splanchnic Analgesia. E. L. Irwin, New Orleans.—p. 450.
Spinal Anesthesia. E. Garside, New Orleans.—p. 453.
Congenital Intestinal Obstruction. M. W. Matthews and H. E. Cannon, New Orleans.—p. 464.
External Otitis: Cause and Prevention. G. E. Adkins, Jackson, Miss. p. 469.
Cardiospasm: Case. O. W. Bethea, New Orleans.—p. 471.
Typhus Fever in Louisiana: Case. J. H. Musser, New Orleans.—p. 473.

Radiology, St. Paul

14: 1-92 (Jan.) 1929

Question of Fundamental Biologic Reaction of Radiation. F. Dessauer, Frankfort, Germany.—p. 1.
Limit Exposure in Radiography. E. A. Pohle and C. S. Wright, Madison, Wis.—p. 17.
Education and Instruction in Roentgenology. W. H. Meyer, New York. —p. 24.
Fundamentals of Roentgen Treatment. H. J. Ullmann, Santa Barbara, Calif.—p. 28.
Differential Diagnosis of Syphilitic Disease of Viscera. F. M. Groedel, Bad-Nauheim, Germany.—p. 32.
Interpretation of Gastric Symptoms. M. F. Dwyer and J. M. Blackford, Seattle.—p. 38.
Radium Treatment in Skin Cancer and Borderline Malignancies. A. Williams, Grand Rapids, Mich.—p. 45.
Use of Small Amounts of Radium at Distance in Treatment of Carcinoma of Mouth and Face. R. T. Pettit, Ottawa, Ill.—p. 55.
Intrathoracic Tumors: Case. R. P. Potter, Marshfield, Wis.—p. 60.
Seemann Spectrograph Tells Story. J. W. Du Mond and A. Hoyt, Pasadena, Calif.—p. 62.
Value of Biplane Fluoroscopic Screen in Reduction of Fractures and Removal of Foreign Bodies, Energizing Both Tubes at Same Time. L. G. McCutchen, St. Louis.—p. 66.
Congenital Absence of Radium. A. E. Blackett, New Glasgow, N. S., Canada.—p. 70.
Subastragaloid Dislocation of Foot: Case. J. F. Elward and L. S. Otell, Washington, D. C.—p. 71.
Cooling System for Use in Hot Climates. C. J. Marshall, Sanford, Fla. —p. 72.

Southern Medical Journal, Birmingham, Ala.

23: 1-88 (Jan.) 1930

Tribute to Southern Physician, Dr. Ephraim McDowell. T. W. Moore, Huntington, W. Va.—p. 1.
Present Status of Practice of Medicine and Sanitation in Cuba. F. M. Fernandez, Havana, Cuba.—p. 6.
Family Physician and Preventive Medicine. W. G. Morgan, Washington, D. C.—p. 9.
Public Health Problems of Special Interest to South. H. S. Cumming, Washington, D. C.—p. 15.
Poliomyelitis. H. L. Amoss, Durham, N. C.—p. 18.
Training and Qualifications of Surgeon. G. J. Heuer, Cincinnati.—p. 22.
*Erysipelas in Infancy and Childhood. J. A. Foote, Washington, D. C. —p. 29.
When Shall We Operate on Infant Mastoid? E. Rosamond, Memphis, Tenn.—p. 34.
Cuban Sanitary and Hospital Activities. J. E. L. Silvero, Havana, Cuba.—p. 37.
Syphilis and Pregnancy. J. R. McCord, Atlanta, Ga.—p. 40.
Newer Knowledge of Heart Disease: VI. Treatment. T. R. Harrison, Nashville, Tenn.—p. 43.
Relation of Internal Medicine to Neurology. L. M. Gaines, Atlanta, Ga. —p. 47.
Syphilitic Lesions Situated at Sphenoidal Fissure: Sphenoidal Syndrome: Two Cases. C. E. Finlay, Havana, Cuba.—p. 51.
Prognostic Evaluation of Angiosclerosis Retinae. W. T. Davis, Washington, D. C.—p. 54.

Erysipelas in Infancy and Childhood.—Foote believes that the specificity of Birkhaug's serum in simple erysipelas is well established. It acts clinically much as diphtheria antitoxin does, requiring about eighteen hours to exert an appreciable local and general action. The amount given, regardless of age, should be the full therapeutic dose found in the market, which is at present 20 cc., corresponding to 1,000,000 skin test units, the larger and more frequent doses being required in the very young. In the new-born or those less than 3 months of age, at least 500,000 units (10 cc.) should be given again in twelve hours. Especially in cases of erysipelas of the new-born, both antitoxin in large dosage and transfusion should be used promptly. When treatment has been delayed more than a day or two in the new-born, transfusion followed by serum would be indicated in the hope of preventing general sepsis. A drop in temperature followed by a subsequent rise is evidence of insufficient dosage or extreme toxemia. When local lymphadenitis is present, larger dosage and more persistent treatment will be required. The gravity of the prognosis in the very young should always be borne in mind. Blood cultures may be of great prognostic aid. As in other forms of treatment, the younger the child, the more grave the prognosis. If transfusion is to be used, it may precede the injection of the antiserum.

Texas State J. of Medicine, Fort Worth

25: 577-638 (Jan.) 1930

Injection Treatment of Varicose Veins. J. E. Daly, Fort Worth.—p. 584.
Chronic Leg Ulcers: Unna's Paste. A. Ochsner and E. Garside, New Orleans.—p. 587.
Neglected Fundamentals in Practice of Obstetrics and Gynecology. W. R. Cooke, Galveston.—p. 598.
Rodent Ulcer of Vulva. M. L. Maffett, Dallas.—p. 603.
Asthma Associated with Focal Infection: Three Cases. T. C. Terrell, Fort Worth.—p. 606.
Spontaneous Pneumothorax, Nontuberculous. I. S. Kahn, San Antonio. —p. 609.
Congenital Cataract. J. O. McReynolds, Dallas.—p. 612.
Phases of Focal Infection from Viewpoint of Otolaryngology. E. P. Hutchings, Marlin.—p. 615.
Relation of Upper to Lower Respiratory Infections. R. L. Works, Brownsville.—p. 618.

United States Naval M. Bull., Washington, D. C.

28: 1-264 (Jan.) 1930

Frontal Attack on Yaws: Plea for Change in Strategy. P. W. Wilson. —p. 1.
Psychology in Aviation. D. G. Sutton.—p. 5.
Value of Peripheral Vision in Depth Perception as Applied to Aviation. A. W. Ley.—p. 13.
Individual Submarine Escape. G. H. Mankin.—p. 18.
Ureteral Stone. E. L. Merritt.—p. 29.
Rational Treatment of Hemorrhoids. R. B. Miller.—p. 34.
Permissible Radiation Exposure in Radiography and Fluoroscopy. T. W. Raison.—p. 67.
Incidence of Amebiasis Carriers Among Native Domestics of Haiti. L. H. Williams and J. A. Thomas.—p. 74.
Sulpharsphenamine. P. R. Stalnaker.—p. 78.
Treatment of Syphilis. I. B. Ballenger.—p. 82.
Examinations for Acute Alcoholism Made at United States Naval Hospital, New York. F. S. Johnson.—p. 85.
Heart Clinic, United States Naval Hospital, Norfolk, Va. R. F. Jones and C. W. Brunson.—p. 88.
Clinical Types of Functional Heart Disease. D. Ferguson.—p. 95.
Use of Histamine in Gastric Analysis. H. E. Ragle and L. E. McDonald. —p. 99.
Diaphragmatic Hernia. W. A. Angwin.—p. 106.
Myiasis: Case. G. W. Cooper.—p. 112.
Bilateral Glioma: Case. W. H. Funk.—p. 114.
Balanitis Nonvenereal. F. R. Moore.—p. 115.
Sensations Under Local Anesthesia. M. D. Willcutts.—p. 117.
Dependable Positive-Negative Pressure Installation. C. B. Camerer.—p. 119.

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FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Brain, London

52: 425-561 (Dec.) 1929

*Cervical Glioma: Case. J. K. Slater and F. E. Reynolds.—p. 425.
*Pathology of Case of Glioma Cerebri. F. E. Reynolds.—p. 436.
Corpus Callosum and Tumors. R. Ironside and M. Guttmacher.—p. 442.
*Skin Reactions in Case of Cervical Sympathetic Paralysis. K. E. Harris. —p. 484.
Respiratory Rhythm in Relation to Mechanism of Thought. F. L. Golla and S. Antonovitch.—p. 491.
Electromyographic Studies of Voluntary Movements in Paralysis Agitans. E. A. B. Pritchard.—p. 510.

Cervical Glioma.—Slater and Reynolds report a case of glioma extending from the third cervical to the first thoracic segment of the cord. It had extended along certain of the posterior nerve roots and thence had invaded the neighboring pia-arachnoid spaces, producing nodular swellings. The neoplasm consisted of a syncytium; nowhere had differentiation into individual cell elements taken place.

Pathologic Structure of Glioma Cerebri.—Reynolds made a pathologic study of a large glioma cerebri which began in the central portion of the brain and extended widely into both cerebral hemispheres. The older parts of the neoplasm consisted of astrocytes which had attained a high degree of specialization, whereas the actively extending and recently formed portions were composed of a syncytium and of cells having as their prototype the spongioblasts of the developing neural tube. At some distance from the neoplastic tissue, there were small groups of preexisting astrocytes which were proliferating. Necrosis in the neoplasm was due probably in part to its outgrowing the blood supply and to the accumulation in the tissues of the waste products of neoplastic metabolism.

Skin Reactions of Cervical Sympathetic Paralysis.—Harris relates his experiences with the sensory nerve test of Lewis and Marvin and the sympathetic nerve test of Marvin in a case of sarcoma of the first rib, complicated by a cervical sympathetic paralysis and later by a paraplegia.

British J. Actinotherapy & Physiotherapy, London

4: 199-234 (Jan.) 1930

Electrical Treatment of Chronic Rheumatism. W. J. Turrell.—p. 202.
Light Treatment in Chronic Rheumatism. J. van Breemen.—p. 205.
Balneology and Hydrology in Rheumatism. G. L. K. Pringle.—p. 208.
Pistany Mud Packs in Treatment of Rheumatism. L. Schmidt.—p. 210.
Rôle of Radioactive Waters in Treatment of Arthritis. V. Coates.—p. 212.
Brine Baths in Treatment of Rheumatism. M. Campbell.—p. 213.
Radiology in Rheumatic and Allied Disorders. S. C. Shanks.—p. 215.
Comparison of Some Methods of Actinometry. T. W. B. Osborn.—p. 217.
Apparatus for Mass Treatment of Children with Ultraviolet Irradiation. B. Goldberg.—p. 218.
Application of Heat of Diathermy in Iridocyclitis. F. D. Howitt.—p. 220.
Physical Treatment of Industrial Rheumatism in Germany. M. Mautner. —p. 222.
Ultraviolet Radiation Therapy in Erysipelas. W. H. Ude.—p. 223.

British Medical Journal, London

1: 1-54 (Jan. 4) 1930

Clinical Aspects of Pain. E. Bramwell.—p. 1.
*Perforative Diverticulitis of Colon. W. I. deC. Wheeler.—p. 5.
Early Diagnosis and Treatment of Cancer. M. Donaldson.—p. 6.
Union and Non-Union of Fractures. A. S. B. Bankart.—p. 8.
Renal Calculus Associated with Solitary Cyst of Left Kidney. J. C. Ainsworth-Davis and T. P. Dunhill.—p. 10.
Acute Syphilitic Appendicitis: Two Cases. G. Evans and E. Rowlands. —p. 11.
Atelectatic Bronchiectasis. A. J. S. Pinchin and H. V. Morlock.—p. 12.
Experiences with Regional Anesthesia. H. W. L. Molesworth.—p. 13.
Eclampsia Treated with Spinal Anesthesia: Case. R. H. Paramore.—p. 15.
*Significance of Oxaluria. J. V. C. Braithwaite.—p. 15.
Acute Appendicitis Complicated with Paratyphoid Fever. J. F. Wilde. —p. 16.
Active Pulmonary Tuberculosis of Exceptionally Long Duration. A. P. Ford.—p. 16.

Perforative Diverticulitis of Colon.—Perforation of the pelvic colon into the free peritoneal cavity in an apparently healthy adult is uncommon. Wheeler's patient, aged 44, took a dose of salts in the morning, before breakfast. He had felt vague pain and discomfort in the abdomen for some days previously. Within an hour of taking the salts the bowels acted twice. He was seized with a sudden excruciating pain in the left iliac fossa after the second movement. He was seen within an hour, and was then in a condition similar to that in an early case of perforated duodenal or gastric ulcer, except that all the local signs and symptoms were confined to the left iliac fossa. The diagnosis was perforative diverticulitis. Within three hours of the onset of pain the abdomen was opened. The pelvic colon was sought, and was found loose, boggy and swollen. The exact site of the perforation was difficult to locate at first, but was subsequently found. The friability of the swollen loop was such that an attempt at suture of the perforation was found to be impossible. The exceptional freedom of the coil from adhesions suggested that there never had been previous attacks of diverticulitis, and confirmed the negative history given by the patient. The perforation was dealt with by leaving the loop of colon outside the abdomen, with a subsequent Mikulicz resection in contemplation if all went well. The cecum was drained, as it was thought unlikely that feces could pass for a considerable time through the affected loop. It was possible to introduce the cecal tube through the primary incision. The pelvis was also drained. At the conclusion of the operation the stomach was washed out, and notwithstanding the short space of time which had elapsed (three hours) since the perforation, it already contained ominous black material. On the day after operation vomiting became frequent; repeated lavage of the stomach gave only temporary relief. A stab wound was made in the extruded loop of bowel, through which enemas were given without effect. Vomiting continued, and it was soon obvious that a high obstruction was established, and high jejunostomy was indicated. A distended loop of jejunum was selected and a catheter was introduced by the usual Mayo method. A few ounces of green fluid came through the tube, but there was no subsequent drainage. Fluid, however, could be freely introduced. Vomiting continued throughout the third day. A second jejunostomy after identification of the flexure was considered, but it was felt that the same result might be obtained by drainage of the stomach and duodenal contents through the medium of a duodenal tube. The tube was swallowed with great difficulty between two attacks of vomiting, and, after lavage, by means of a nasal tube. It was now possible to aspirate fluid every half-hour with a record syringe. Three pints was withdrawn in twelve hours. The character of the fluid completely changed; at first it was black; afterward it became orange with a foul, but not a fecal, smell. The toxicity of this fluid was made evident by the fact that if aspiration was delayed on any occasion the condition of the patient became rapidly worse. The mechanical difficulties encountered were dealt with in the manner indicated, but, in addition, it was necessary to cope with progressive failure of strength from toxemia and loss of fluids. Every few hours a pint (12 pints in all) of 10 per cent dextrose solution in distilled water was administered intravenously. During and at the end of each transfusion insulin was given hypodermically (1 unit to 3 Gm. of dextrose). Fluids were given continuously by the drop method into each axilla; water, peptonized milk and a predigested food were introduced through the jejunostomy tube. It was interesting to note that, immediately after a transfusion, duodenal regurgitation increased, necessitating aspiration on each occasion. The duodenal contents, immediately on their withdrawal, were injected through the jejunostomy tube with an aspirating syringe. Coincidentally with this procedure the cecum commenced to drain. The general condition of the patient improved. On the evening of the sixth day the signs of high obstruction again appeared; restlessness and delirium quickly followed. Aspiration of the duodenal contents and intravenous medication gave no relief. He died twelve hours later. A postmortem examination was refused, but the loop of bowel was examined, and proved to be the site of perforative diverticulitis.

Significance of Oxaluria.—Braithwaite holds that the passage of calcium oxalate crystals is not always as innocuous as is supposed, and that some cases of unexplained spontaneous hematuria may be due to them. Although calcium oxalate can cause some mechanical injury to the kidney, it is the safest form in which the body can excrete any abnormal accumulation of oxalates in its substance.

Bull. et Mém. de la Soc. Méd. des Hôpitaux de Paris

53: 1341-1370 (Dec. 2) 1929

Relation Between Arterial Hypertension and Kidney Disease. F. Rathery.—p. 1341.
*Meningococcus Septicemia: Treatment with Acridine Dyes. Veillon, R. Martin and E. Roux.—p. 1343.
Hodgkin's Disease with Predominance of Splenic Symptoms. H. Mondon and R. Duliscouet.—p. 1346.
*Rheumatic Fever: Onset with Peritoneal Symptoms. Costedoat.—p. 1353.
*Primary Tuberculous Infection in Infant. L. Bernard, M. Lelong and M. Lamy.—p. 1356.
*Tuberculosis in Four Infants Vaccinated by Ingestion of B C G and Left in Tuberculous Environment. P. Rohmer and R. Chaussinand.—p. 1365.
Purulent Acute Cerebrospinal Meningitis with Staphylococci. Laporte, Calazel and Benoit.—p. 1367.

Meningococcus Septicemia: Treatment with Acridine Dyes.—Veillon et al. report their observations regarding the efficacy of acriflavine hydrochloride solutions. Their patient, a man, aged 25, had been suffering for two weeks from pseudo-malarial fever with pain in the joints and skin eruptions. At intervals of approximately thirty hours, seizures of rigor were noted with increase in temperature and rapid pulse, headache and arthralgia, as well as an increase in the skin eruptions during the attack. A blood culture revealed type B meningococci; these micro-organisms were also seen in a culture from the rhinopharynx. There were no meningeal symptoms. Spinal puncture was not done. Three and one-half weeks after the onset of the disease, 10 cc. of an acriflavine solution was injected intravenously. The temperature decreased but the attacks recurred. Three injections, of 20 cc. each, were given at intervals of three or four days. The patient recovered rapidly and was reported in good health five months later.

Rheumatic Fever: Onset with Peritoneal Symptoms.—Costedoat's patient, a girl about 20 years of age, had had frequent attacks of sore throat. Tonsillectomy had been done several years previously and had brought relief. Except for an intestinal disorder five years before, as a consequence of which chronic constipation had developed, the patient was well. Acute abdominal pain coincident with a rise in temperature was the first symptom noted. Shortly afterward the patient complained of pain in all the joints. Roentgen examination of the digestive tract did not show any especially abnormal conditions. Tenderness of the abdomen persisted, however, and appendectomy was done. The appendix did not show pathologic changes. The temperature rose during the two days following the operation, then dropped and remained normal for two weeks. A gradual increase then occurred coincident with arthralgia and a cardiac murmur. Treatment with salicylic acid induced a fall in temperature with relief of the rheumatic pains. The patient was discharged from the hospital, but pain in the heart area recurred at intervals, although no abdominal symptoms were reported. In two other patients whose case histories were reported by Pilod and Meerssemann, similar symptoms were seen. The resected appendix was normal although infiltration of the abdomen and a slight congestion were noted. Pain in the joints and involvement of the heart gradually developed. Costedoat points to the difficulty of diagnosis and the possible fixation of the virus causing the rheumatic disease in the abdominal wall.

Primary Tuberculous Infection in Infant.—Bernard et al. report this occurrence in an infant, aged 10 months. The mother had pulmonary tuberculosis and died four months later. Examination of the infant disclosed an extensive tuberculous ulceration on the chest below the sternum coincident with enlargement of the lymph nodes in the axilla. Two cutireactions were negative. A third test done two weeks after hospitalization was positive. Cicatrization of the ulcer was complete within two months, although redness of the skin persisted. The lymph nodes in the axilla necessitated placing a drain, and pus containing tubercle bacilli was withdrawn. A fistula developed which persisted for five months. Although the child had gained weight, death subsequently resulted from bronchopneumonia. Necropsy could not be done.

Tuberculosis in Four Infants Vaccinated by Ingestion of B C G and Left in Tuberculous Environment.—Rohmer and Chaussinand direct attention to the importance of removing infants from a tuberculous environment for from six to eight weeks after vaccination by ingestion of B C G as long as immunity is not established. Of four infants who had been vaccinated, three died; in the fourth a nonvirulent type of tuberculosis developed. In all instances the parents were tuberculous.

Paris, Médical

2: 513-528 (Dec. 14) 1929

Mixed Chancre. G. Milian.—p. 513.
*Diphtheria in Immunized Persons. P. Lereboullet and J. J. Gournay.—p. 519.
*Gastric Symptoms of Syphilis. E. Chabrol.—p. 522.

Diphtheria in Immunized Persons.—This occurrence is very rare and the course of the disease, according to Lereboullet and Gournay, is a mild one. They point to the importance of proper administration of the toxin-antitoxin injection according to Ramon's directions. However, the immunization is not effective until from six to eight weeks after the last injection and should be controlled by a Schick test. In some instances other vaccinations have been mistaken by children's guardians for diphtheria immunization, thus giving rise to erroneous statistics on the efficacy of such immunization. The authors ignore unreliable statements and emphasize the value of the Schick test.

Gastric Symptoms of Syphilis.—Chabrol discusses the symptomatology and points to the importance of suspecting syphilis in all atypical gastric disorders.

2: 529-560 (Dec. 21) 1929

Gynecology During 1929. S. Huard.—p. 529.
*Bluish Discoloration of Umbilicus in Ruptured Ectopic Pregnancy: Umbilical Ecchymosis (Cullen's Sign). E. Forgue.—p. 541.
Bacterial Flora of Vagina. P. Hardouin.—p. 545.
Obstetrics During 1929. J. Ravina.—p. 552.
Pyelonephritis as Indication for Interruption of Pregnancy. A. Fruhinsholz.—p. 555.
Parametritis: Four Cases. L. Schil.—p. 559.

Bluish Discoloration of Umbilicus in Ruptured Ectopic Pregnancy: Umbilical Ecchymosis (Cullen's Sign).—Forgue directs attention to the symptoms in deep-lying hemorrhages which are indicated on the surface of the abdomen by infiltrations and characteristic ecchymoses. From a review of the literature and his personal experience he points out that the sign may be noted under other conditions than ectopic pregnancy. He proposes to change the name from "Cullen's sign" to "blue umbilical sign" and to extend its importance by increasing its visibility through better illumination.

Presse Médicale, Paris

37: 1557-1572 (Nov. 30) 1929

*Relation Between Cellular Adipose Tissue and Combustion of Fats. M. Perrin and P. Mathieu.—p. 1557.
*Primary Esophagitis. J. Guisez.—p. 1558.
*Complete Biliary Fistula: Choledochogastrostomy. Sauvage.—p. 1560.
*Clinical Value of Change of Temperature Curve During Menstruation in Tuberculous Women. J. Caussimon.—p. 1561.

Relation Between Cellular Adipose Tissue and Combustion of Fats.—Perrin and Mathieu discuss the various types of obesity on the basis of hyperfunctioning or dysfunctioning of the cellular adipose tissue. They distinguish between four distinctly characterized forms that may be accepted as a guide in the treatment of such disorders. Obesity may be caused by a decreased rate of combustion or by a complete inability to reduce fats. Disorders of tropic origin are responsible for another type of obesity. In a last group a mixed origin is recognized.

Primary Esophagitis.—Guisez considers retention of imperfectly masticated food in the esophagus to be the main cause of the development of inflammations of the walls. Other factors favoring local irritation are common table salt, pepper and other spices, and to a great extent alcohol. Incomplete stricture of the esophagus may be congenital or caused by compression due to neoplasms or hypertrophy of the liver. In either case it may also lead to the development of esophagitis. It is difficult to diagnose the condition roentgenologically, and esophagoscopy is the best method for early recognition of the inflammation, which, according to Guisez, is of more frequent occurrence than has

been thought heretofore. The author stresses the importance of adequate dental care and of eating slowly to ensure proper mastication.

Complete Biliary Fistula: Choledochogastrostomy.—Sauvage reports the performing of this operation on a man, aged 65, who had been suffering from biliary colic for twelve years. Within the preceding seventeen months the attacks of colic became more frequent and phlebitis developed in his right leg. Although this healed spontaneously, his general condition became worse and surgical intervention was necessary. Resection of the gallbladder was complicated by adhesions. A small drain was introduced into the hepatic duct, tamponade was done and a large subhepatic drain was inserted. The drain in the hepatic duct did not function, and was therefore removed six days later. The condition of the patient gradually improved and the subhepatic drainage was gradually discontinued, the fistulous tract closing little by little. Forty days after the operation symptoms of infection were noted and drainage was reestablished. Five times the fistula was permitted to close, but each time it was necessary to reestablish the drainage. After the opening of a biliary abscess and the replacing of a drain, the condition did not show improvement, and the patient suffered considerably. Gastrostomy was done and a drainage tube was inserted. Four days later the subhepatic drain was joined to the gastric tube by means of a piece of glass tubing to give control. The bile immediately entered the stomach and marked improvement of the patient's condition was noted. He lost his thirst and regained his appetite and normal digestive power. Four months after the operation he returned to his former occupation. Sauvage stresses the strict asepsis imperative for such an intervention.

Clinical Value of Change of Temperature Curve During Menstruation in Tuberculous Women.—Caussimon points to the frequent slight rise in temperature noted normally previous to menstruation, coincident with a decrease during the menstrual period. In women with active pulmonary tuberculosis, on the other hand, three distinct types of temperature variation are noted. An excessive increase of temperature in the premenstrual period is followed by marked hyperthermia during and after this time. The lung condition in all cases follows the temperature curve and may therefore be taken as a guide to the prognosis of the disease. In patients with so-called active amenorrhea, the temperature rises and the duration of the period is indicated by the temperature curve which is coincident with aggravation of the lung condition. "Silent" amenorrhea does not present any outward sign of genital activity. Increasing cachexia with a serious lung condition is noted and is inevitably fatal.

37: 1589-1604 (Dec. 7) 1929

Diabetes and Tuberculosis. L. Bernard.—p. 1589.
Painful Angioneurosis of Breast. A. and L. van Bogaert.—p. 1892.
*Splenectomy in Banti's Disease. S. Nahabetian and B. Manuelian.—p. 1594.

Splenectomy in Banti's Disease.—Nahabetian and Manuelian's patient, a man, aged 50, was hospitalized for gastric pain and hematemesis. Anemia, the presence of ascites and an enlargement of the spleen were noted. Thirty years previously the patient had had malaria, but he did not have fever or seizures at the present time, and examination did not disclose the presence of parasites in the blood, although the count was low. In spite of diuretics given to relieve the ascites, the condition became worse with frequent hematemesis and melena. Roentgen examination confirmed the enlargement of the spleen and surgical intervention seemed indicated. A spleen weighing 1,200 Gm. was resected. Eleven days after the operation, during a severe coughing spell, the abdominal wound opened and several loops of intestine passed out through the opening. The loops were returned to the abdominal cavity under general anesthesia and the wound healed. However, within the next two months renewed formation of ascites necessitated puncture, which was done three times; in all 16 liters of fluid was withdrawn. Improvement of the condition was rapid from then on, and two and one-half months after the splenectomy the patient was discharged with an almost normal blood count. The authors point out that in this case the formation of ascitic fluid stopped after removal of the toxic focus which had influenced the liver.

37: 1605-1620 (Dec. 11) 1929

*Contraction of Gallbladder. M. Chiray and A. Lomon.—p. 1605.
Acute Ascending Spinal Paralysis with Hematoporphyria: Case. A. Courcoux, J. Lhermitte and Boulanger-Pillet.—p. 1609.
*Gastroptosis: Surgical Treatment. O. Lambret.—p. 1613.
Osteosynthesis According to Cunéo: Experimental Study. R. Frantz and M. Mayer.—p. 1616.

Contraction of Gallbladder.—Chiray and Lomon present the results of roentgenography of the gallbladder after stimulation in three cases from their material comprising 600 observations. The contractions occur rapidly within from two to three seconds and according to the authors give proof that the gallbladder is a contractile active reservoir. They point to the development of the technic of inducing and recording the contractions which may be used as a guide in testing the functioning of the gallbladder.

Gastroptosis: Surgical Treatment.—On the basis of his experience in twenty-eight patients Lambret considers surgical intervention essential in the treatment of such disorders. He believes that this condition is more frequent than has been recognized heretofore and that it may be found in all patients in whom ulcer, cancer, lithiasis, appendicitis and nutritional and neurologic disorders may be eliminated. His method of operation consists of a modification of the Perthes operation, as the greater curvature is fixed by burying in the stomach wall a portion of the fascia taken from the abdominal muscles of the left side. This aponeurosis is pedicled and enters the abdomen between two ribs, being sutured to the round ligament at the point where it leaves the liver. In addition Lambret fixes the fascia in a seroserous canal, using the technic of Witzel. Lambret could follow the late results of this operation for more than two years in thirteen patients. Complications of the operation in ten patients will be reported at a later date. Five observations were too recent to be discussed in this article.

Revue Neurologique, Paris

2: 481-656 (Nov.) 1929

*Localization of Function of Sleep: Anatomic and Clinical Study. G. Marinesco, St. Draganesco, O. Sager and A. Kreindler.—p. 481.
*Fever and Tachycardia Produced by Cerebral Tumors. G. R. Lafora.—p. 499.
Epidural Spinal Abscess. W. G. S. Smitt.—p. 512.
Rolandic Hemangioma: Case. J. Dereux and P. Martin.—p. 519.

Localization of Function of Sleep.—Marinesco et al. discuss this problem on the basis of their previous experiments on cats and of a study of three cases of tuberculous meningitis and one case of tumor of the cerebellum. They conclude that the function of sleep depends on a number of reflexes of the sympathetic nervous system. The chain of communicating foci in the gray matter surrounding the aqueduct of Sylvius is continued into the gray substance enclosing the third ventricle and into the nerve centers of the infundibulum. It most probably also has an action on the thalamus. Inhibition of one of these reflexes may cause sleep. However, subsequently the mechanism of functional substitution is evoked and normal function coincident with awakening is restored. Compression of the gray matter in the aqueduct by a tumor in one patient with tuberculous meningitis caused loss of function of the reflex centers and hypersomnia, although no lesion could be seen microscopically. In the patient with the tumor of the cerebellum, however, the function of sleep had remained normal. The gray matter around the aqueduct of Sylvius was not pathologic in spite of distention of the third ventricle with proliferation of the neuroglia.

Fever and Tachycardia Produced by Cerebral Tumors.—On the basis of an extensive review of the literature and a consideration of the clinical history of his patient, Lafora states that the tumor of the sensory region led to irritation of the cortical vasomotor centers and a rise in temperature ensued. Spinal puncture and the withdrawal of 8 cc. of fluid caused a temporary drop. Although the site of the true thermoregulatory centers is in the infundibulum of the third ventricle as has been demonstrated by experiments and clinical observations, his case gives proof of the existence of additional thermoregulatory centers in the cortex.

Pediatria, Naples

37: 1167-1222 (Nov. 1) 1929

*Importance of Cultivation of Tubercle Bacillus in Diagnosis of Tuberculosis. M. Miraglia.—p. 1167.
Action of Ultraviolet Rays and of Viosterol (Irradiated Ergosterol) in Rickets. A. Macchi.—p. 1175.
*Milk-Flour Mixture in Infant Feeding. M. Flamini.—p. 1191.
Henoch's Abdominal Purpura: Case. F. de Capua.—p. 1204.

Importance of Cultivation of Tubercle Bacillus in Diagnosis of Tuberculosis.—Miraglia relates that in eighteen cases of tuberculous infection he instituted a microscopic search for tubercle bacilli in the cerebrospinal fluid, in the pus, in the sputum and in the urine, depending on the case, and obtained a much smaller percentage of positive results than he secured by the implantation of the same materials in an egg culture medium (Hohn method). In this medium the colonies became manifest after seven days in one case and by the middle of the second week in the others. On the basis of these results, and taking account also of the relative simplicity of the technic, the author, while recognizing the value of other diagnostic proofs and, especially, of the direct examination of the bacillus, recommends that the cultivation test be applied in every case of suspected tuberculosis.

Milk-Flour Mixture in Infant Feeding.—Flamini's experiments with this mixture extended over a period of more than four months, being applied to the children of the goutte de lait in Rome. This mixture consists mostly of soluble carbohydrates, some nitrogenous matter, fats, saccharose and starch. The children treated may be placed into four groups: (1) infants under 6 months of age; (2) normal children over 6 months of age; (3) children with defective growth, and (4) children affected with rickets. The milk-flour mixture was found to have a marked nutritive value, owing to the high percentage of fat and protein substances that it contains. It is easily digested by reason of the small quantity of starch that enters into its composition. The observations on normal and dystrophic children showed the marked eutrophic potency of the mixture due to its high vitamin content. The food possesses evidently marked antirachitic action. From researches on the blood crasis of children nourished with the mixture, it is evident that it tends to improve the crasis itself, and to effect an increase in the number of red corpuscles and in the hemoglobin.

37: 1223-1278 (Nov. 15) 1929

Changes in Reticulo-Endothelial System in Leishmaniosis in Children. F. de Capua.—p. 1223.
Observations in Certain Atypical Cases of Leishmaniosis in Children. A. Bocchini.—p. 1235.
*Use of the Di Cristina Vaccine in One Hundred and Fifty-Six Cases of Typhoid Infection. I. Gatto.—p. 1244.
*Enzyme Reaction in Congenital Syphilis. U. de Gironcoli.—p. 1253.
Glycemia. S. Quadri.—p. 1260.

Use of Di Cristina Vaccine in Typhoid Infection.—Gatto concludes that the rational use of the Di Cristina vaccine in the treatment of typhoid constitutes an effective and reliable remedy because (1) the mortality is reduced; (2) the total duration of the disease is shortened; (3) a cure is effected in a large number of cases by a single injection (in the cases reported in 18.5 per cent); (4) a rapid improvement in the general and local conditions is secured; (5) it makes possible in grave cases the feeding of the patient; (6) it diminishes considerably the possibility of complications, and by prolonging the treatment recurrences are prevented, and (7) there are few contraindications (hemorrhagic diathesis, grave insufficiency of the circulatory system).

Enzyme Reaction in Congenital Syphilis.—De Gironcoli found the enzyme reaction more sensitive than the Wassermann test, especially in treated cases of syphilis and in cases in which the personal history pointed to syphilis. While the enzyme reaction need not entirely replace the Wassermann test, it should be, in every case, the necessary complement, by reason both of the results that it gives and of the simplicity of the technic.

Policlinico, Rome

36: 601-648 (Dec. 1) 1929. Medical Section

Researches on Urobilinuria and Portal Hypertension. G. Melli.—p. 601.
*Clinico-Experimental Researches on Resistance to Hemoglobin. G. P. Cucco.—p. 625.
*Acetylcholine and Its Clinical Use. L. Villa.—p. 636.
*Medical Treatment of Echinococcus Cyst. G. Lolli.—p. 643.

Clinico-Experimental Researches on Hemoglobin Resistance.—Cucco studied by the spectroscopic method the hemoglobin resistance in 100 cases. In the blood of persons with pulmonary tuberculosis the hemoglobin resistance does not vary essentially from the normal figures, except after abundant hemoptysis. The same is true of persons with malignant tumors. In general, the author found in his study of the hemoglobin resistance of human blood (of both healthy and sick persons) and of the blood of rabbits that the resistance did not vary in correspondence with variations in the amounts of reagents used.

Therapeutic Value of Acetylcholine.—Villa tested experimentally the therapeutic efficacy of acetylcholine, which was introduced a few years ago but which is not yet widely used in the clinics. He describes the results that he secured in two cases of senile gangrene of the limbs, one case of primary endarteritis with gastric ulcer, one case of multiple arterial thrombosis with hemiplegia secondary to streptococcic endocarditis, one case of lead colic, two cases of gastric crises in association with spinal radiculitis and dorsal tabes, and one case of dorsal tabes with lancinating pains. The author concludes that the use of acetylcholine should be known to the medical practitioner for its value as an early intervention in gangrenes of arteritis or thrombosis of whatever nature, since often, before the patient reaches the hospital, the time for such intervention has passed. Certain surgical interventions on the vegetative innervation (sympathectomy, resection of cervicothoracic sympathetic nerve), with a view to modifying pathologic conditions referable to an angiospastic mechanism, might well be preceded, the author thinks, by a therapeutic trial of acetylcholine.

Medical Treatment of Echinococcus Cysts.—Lolli concludes from his researches on rabbits that neoarsphenamine does not influence in the least the course of echinococcus disease in man. In fact, it does not change the vitality of echinococcic elements that, on inoculation into the rabbit, give rise to new cyst formations. Furthermore, arsphenamine therapy, applied to the rabbit simultaneously with the inoculation of echinococcus material, does not succeed in preventing the evolution of the parasitic disease. This proves that neoarsphenamine is inactive not only in cyst formations but also in the newest elements that are particularly delicate. Hence, no value can be assigned to the drug even for the prophylaxis of secondary echinococcosis. Since it is now so easy to produce echinococcus disease in the rabbit, it is reasonable to expect that no drug will be applied to man until its efficacy has been shown by animal experimentation, so that harmful illusions may not be engendered and the surgical intervention, from which alone, thus far, a cure can be anticipated, unduly postponed.

Tumori, Milan

3: 663-766 (Nov.-Dec.) 1929

*Colloidal Lead in Treatment of Malignant Tumors. S. Dentici, A. Moratti and P. Pattarin.—p. 663.
Cancer of Stomach. V. Pettinari.—p. 728.

Colloidal Lead in Treatment of Malignant Tumors.—Dentici et al., on the basis of their trials, state that, while a favorable though transitory result may sometimes be secured with lead therapy, in its final effects saturnotherapy constitutes anything but a sure remedy in the treatment of malignant tumors. While in none of their patients was death referable to acute or chronic lead poisoning, the disadvantages of a toxicologic nature associated with the administration of colloidal lead for therapeutic purposes are unquestionable and sometimes require a prompt interruption of treatment in order not to hasten the death of the patient. The authors are very guarded in their evaluation of the results secured. Taking account of the peculiar anatomoclinical evolution of tumors, they hesitate to speak of stable improvements or of cures. Owing to the constant supervision of patients that is necessary, lead therapy may be employed only in thoroughly organized clinical and hospital institutes provided with well equipped laboratories.

Archivos Españoles de Pediatría, Madrid

13: 641-704 (Nov.) 1929

*Pyuria in Early Childhood: Treatment with Autovaccine. A. Romeo Lozano.—p. 641.
*Paratuberculous Pulmonary Infiltrations in Children: Epituberculosis. M. Laffon y Soto and F. Jiménez Ontiveros.—p. 658.

Pyuria in Early Childhood: Treatment with Autovaccine.—Romeo Lozano, in confirmation of his previous experience, advises the use of autovaccine in the treatment of pyuria in infants. He recently treated eight children less than 2 years of age, in the acute stage of the disease. He started the treatment with methenamine and gave the autovaccine, subcutaneously, as soon as it was prepared. In all his cases he obtained recovery in less than one month. In the septicemic forms the autovaccine may fail; but in most cases, even in the presence of renal lesions complicating the lesions of the renal pelvis and of the bladder, the autovaccine gives good results. The author presents a review of the literature in support of his opinion.

Paratuberculous Pulmonary Infiltrations in Children.—Laffon y Soto and Jiménez Ontiveros consider that the principal forms of pulmonary infiltrations are splenopneumonia, epituberculosis and some small perifocal infiltrations. All these forms are generally constituted by minimal and early tuberculous lesions. The patients have good defenses against tuberculosis and they are in good condition of allergy. The fever and the general symptoms do not correspond to the extension of the infiltration. In extensive infiltrations, dulness, diminution of the murmurs and slight bronchial respiration are observed; moist râles are not present. The heart is not displaced, which proves that there is not a pleural effusion. The small perifocal infiltrations are seen only in the roentgenogram, since no physical signs are noted. The cutaneous reaction is always positive, though sometimes it is temporarily negative according to the oscillations of the allergic level. There is no sputum or it is very scanty and negative with regard to tubercle bacilli. Three of the authors' cases were of splenopneumonia; in one there was an epituberculous infiltration and in one an extensive perifocal inflammation in which reabsorption took place in about two months. Regression took place in all cases. In four of the authors' cases the infiltration appeared during the evolution of measles, and in one patient the infiltration appeared with the weaning. The authors say that roentgen examination of apparently healthy children, especially those who live in a tuberculous environment, should be very useful to detect paratuberculous pulmonary infiltrations, which frequently pass unobserved, and also to give a correct interpretation of the various clinical pictures that the infiltrations may cause.

Semana Médica, Buenos Aires

36: 1609-1684 (Dec. 5) 1929

Nondiabetic Glycosuria: Five Cases. P. Escudero.—p. 1613.
*Premature Separation of Normally Inserted Placenta: Two Cases. E. A. Boero and R. Schwarcz.—p. 1618.
Asthenohyposphyxic Splanchnoptosis ("Léiasthénie"). T. Martini and M. Joselevich.—p. 1622.
Relation of Pulmonary Anthracosis to Tuberculosis and Silicosis. R. F. Vaccarezza and E. Savino.—p. 1624.
*New Instruments for Exteriorizing Uterus in Conservative Operations. A. Chueco.—p. 1641.
Diabetes and Pregnancy. G. Peco.—p. 1645.
*Ovarian Insufficiency Caused by Tumor of Hypophysis. S. E. Bermann.—p. 1649.
Foreign Body in Bronchus: Pneumotomy. S. Satanowsky.—p. 1651.
Acne Keratosa: Case. M. E. Massa.—p. 1657.
Dislocation of Trapezium: Removal. R. C. Ferrari.—p. 1662.
Treatment of Tuberculous Osteoarthritis with Lavalle's Operation. A. Brandao Filho.—p. 1668.
Grave and Acute Hematoma of Vagina, Parametrium and Abdomen. R. F. Coulin.—p. 1670.

Premature Separation of Normally Inserted Placenta.—Boero and Schwarcz report two cases of premature separation of a normally inserted placenta, at eight and a half and at eight months. In the first case (partial separation of the placenta and retromembranous hematoma), the fetus was alive when a sudden and intense hemorrhage occurred. As the patient lived in a distant town, she was not observed until four hours later. In the second case, the fetus was dead and the hemorrhage was internal. In both cases the uterus increased in size rapidly and considerably. The authors say that premature separation of the placenta usually produces the initial stage of labor, which should be allowed to progress to delivery. They advise the execution of what they call "delivery in artificial avalanche." This method consists in encouraging immediate delivery by means of digital dilation of the cervix, advantage being taken of the increased intra-uterine pressure, strong contractions, either spontaneous or reinforced by the administration of pituitary extract, dilatability of the cervix at the moment, and a tendency to an accelerated delivery, in order to hasten natural evolution. Slightly opened cervices, from 1 to 3 cm., are easily and rapidly dilated, without anesthesia, by gentle digital dilation, first unimanual and then bimanual. If the contractions are strong, when a dilatation of from 5 to 7 cm. has been obtained the expulsive force of the uterus will do the rest. Otherwise, in about twenty minutes a dilatation of from 7 to 8 cm. is obtained and then the membranes are ruptured (either spontaneously or artificially). After delivery, the uterine contraction promotes the expulsion of either the hematoma or the blood clots. This should be the method of choice in multiparous women. Its principal usefulness is found to be in the cases of premature partial separation of the placenta in which the fetus is alive, as in the first of the authors' cases in which the fetus survived one hour after delivery.

New Instruments for Exteriorizing Uterus in Conservative Operations.—Chueco describes the technic and illustrates the instruments that he designed to exteriorize the uterus by the vaginal route in conservative operations.

Ovarian Insufficiency Caused by Tumor of Hypophysis.—In Bermann's patient, aged 37, amenorrhea occurred six years before the appearance of the symptoms; roentgenograms revealed the presence of a tumor in the hypophysis. The symptoms were: disturbances of sight, intense nausea, noises in the head, chills, general discomfort and a constant sensation of faintness. Intravenous injections of mercury (negative Wassermann reaction) and of several ovarian extracts failed. After thirty injections of an extract of the anterior lobe of the hypophysis, some of the symptoms disappeared and others greatly diminished, though the amenorrhea persisted. The author believes that this case demonstrates the effects of destruction of the hypophysis on the genital functions in the human being. It demonstrates also the therapeutic value of injections of extract of the anterior lobe of the hypophysis in the disturbances of ovarian insufficiency when they are caused by destruction of the hypophysis. The therapeutic value of this extract, however, is relative, since its effects are only transient, probably because of the rapid elimination of the hypophyseal substances. In order to obtain a continued action of the extract it should be given at intervals.

Siglo Médico, Buenos Aires

84: 577-600 (Dec. 7) 1929

*Genesis and Treatment of Asthma. C. Jiménez Diaz.—p. 577.
Acute Anterior Poliomyelitis: Treatment. M. P. Jiménez.—p. 588.

Genesis and Treatment of Asthma.—Jiménez Díaz made a study of the flora in Spain in order to find out the relation of pollination of plants to the regional distribution of asthma in that country. The author divides the forms of asthma, according to their occurrence, into those which appear in spring, in summer and in autumn. In the forms of asthma which appear in spring the pollen of the gramineous plants (especially *Bromus, Phleum, Dactylis, Lollium, Hordeum, Secale, Agrostis, Poa, Festucas, Trisetum* and *Anthoxantum*) was the cause. The olive tree (*Olea europaea*) plays a considerable rôle in the production of spring asthma; it causes at least 30 per cent of the spring cases. In summer asthma, besides the gramineous plants mentioned, others were found responsible, especially corn, and also *Cynodon*, sorghum, *Lygium*, rice and some other plants. The asthma of autumn is rare in Spain; and the plants whose pollen causes it are some gramineous plants and some *Chenopodiaceae* and *Amarantaceae* plants and *Xanthium* as well as common reed grass, and some trees and palm trees. The author gives a chart, in which the duration of pollination of several asthmogenic plants appears, which permits timing the origin of the sensibilization and basing on this knowledge the treatment of the condition. The author lists the plants which are of great importance in the production of asthma, those which are of minor importance, and those which, nothwithstanding the abundance of their growth, have no asthmogenic importance in Spain. To prove the abundance of pollen in the air,

the author used a slide smeared with glycerin or with petrolatum, which he exposed to the air over night and examined the next day under the microscope, with a drop of compound solution of iodine. The differentiation between pollen and atmospheric dust is not difficult, and it is only a matter of practice. In sixty-eight cases of asthma caused by pollen that the author observed, gramineous plants were responsible in forty-six, and other families of plants in twenty-two. The author also prepared extracts from the asthmogenic plants, with which he made skin tests, whose results were uniform with the data obtained in his botanic experiences.

Deutsche medizinische Wochenschrift, Berlin

55: 2081-2124 (Dec. 13) 1929

*Maximal Fever Therapy in Infectious Diseases. P. Mulzer and E. Keining.—p. 2086.
Orthopedics in General Practice. K. Ludloff.—p. 2091. C'en.
Treatment in Placenta Praevia. E. von Ammon.—p. 2094.
Modern Methods in Diagnosis and Treatment of Gonorrhea. W. Frei.—p. 2097. C'en.
Unsuccessful Curettage of Uterus in Suspected Abortion: Uterus Duplex Revealed by Roentgenoscopy. P. Esch.—p. 2098.
Injury of a Gravida Caused by Penetration of Handle of Pitchfork Through Anus into Rectum: Treatment. R. Hubrich.—p. 2099.

Maximal Fever Therapy in Infectious Diseases.—Mulzer and Keining discuss the principles of shock therapy. In the reaction of the body to the stimuli they differentiate between three phases. The first or the threshhold stimulation phase is that therapy which aims to effect reactions only in the focus of the disease, and which avoids a general reaction of the organism. This phase of the shock therapy adheres to the Arndt-Schulz law according to which weak stimuli increase physiologic activity whereas strong stimuli inhibit or abolish it. The second phase mentioned by the authors is the provocation phase, which results from strong stimuli and which propagates the disease rather than cures it. Consequently it has no therapeutic value. The authors term the third phase of the shock therapy the "panergic" phase. In this form the whole organism reacts to such a degree that the reaction in the focus of the disease does not become noticeable. However, it brings good therapeutic results. That therapy which utilizes the "panergic" phase is the maximal fever therapy. Inoculation malaria is one form of it, but because malaria therapy has many shortcomings, the authors are now studying other methods for applying the maximal fever therapy. Compared with the threshold phase of the shock therapy, the therapeutic results of the "panergic" phase are superior. Consequently, the authors consider the maximal fever therapy the method of choice.

Klinische Wochenschrift, Berlin

8: 2361-2408 (Dec. 17) 1929

Respiratory Insufficiency: Its Causes and Compensatory Mechanism. E. Rechnitzer.—p. 2361.
*Results of Dietary Treatment in Tuberculosis of Skin. P. Wichmann.—p. 2366.
Physical Allergy of Skin: Late Urticaria of Mechanical Origin. E. Urbach and P. Fasal.—p. 2368.
Experimental Researches on Allergy and Immunity on Same Focus of Tuberculous Reinfection. E. A. Schnieder.—p. 2377.
*Injections of Milk for Treatment of Suppurative Buboes. E. Kromayer, Jr.—p. 2378.
Changes in Potassium-Calcium Quotient of Serum Under Influence of Calcium of Parathyroid Preparations. G. Berencsy.—p. 2379.
Significance of Anacidity of Stomach for Infection with Balantidium Coli. E. Masing.—p. 2380.
Phosphorus Content of Blood in Chickens Inoculated with Rous Sarcoma. E. Haam and R. Stöhr.—p. 2382.

Results of Dietary Treatment in Tuberculosis of Skin.—Wichmann employed the dietary treatment of Gerson, Sauerbruch and Herrmannsdorfer in thirteen patients with tuberculosis of the skin. The regulations were strictly adhered to; namely, the diet was salt-free and the patients were given cod liver oil which contained phosphorus. Local therapy was discontinued during the time the patients received dietary treatment. In nine of the thirteen cases the results of the diet were favorable. Two of these nine patients had been treated for several years with other methods and had shown no improvement. Of the four persons who were not influenced by the dietary treatment, three had been treated only for from four to five weeks. The other patient, however, had received dietary treatment for thirteen weeks, and no improvement could be noted. On the contrary, the lupus progressed. In the majority of cases the tuberculous ulcerations of the skin and of the mucous membrane disappeared entirely, so that infiltrations were no longer noticeable. The exudative forms of lupus also showed a marked improvement. However, the dry squamous forms did not react to the dietary treatment. A complete disappearance of all lupus nodules was not observed in any of the cases. The assertion of some authorities that the usual hospital or sanatorium diets, which are rich in calories, accomplish the same results as the Gerson-Sauerbruch-Herrmannsdorfer diet is disproved by the author. Concerning the permanence of the results, he states that, after three years, of eight patients who had shown favorable results at the time of the treatment, four had no relapse, while in three others the disease became progressive again. The author thinks that the results of dietary treatment are more favorable than those that are gained if only light treatment, specific therapy or chemotherapy is applied. In other groups of patients the author investigated the most important factor in the dietary treatment. He comes to the conclusion that the cod liver oil containing phosphorus is helpful; however, it is not the only factor. The omission of sodium chloride seems to be of minor significance, because the results were almost as favorable when it was not used.

Injections of Milk for Treatment of Suppurative Buboes.—Kromayer directs attention to the great therapeutic value of milk injections in the treatment of suppurative buboes. Of 131 patients who came under his observation during the last three and one-half years, forty-five received only local antiphlogistic treatment, and eighty-six were treated with milk injections. Of the forty-five only six recovered spontaneously, that is, without operative treatment, while of the eighty-six that had received milk injections, fifty-eight recovered without surgical treatment. The technic of the milk injections is described as follows: Fresh cow's milk is boiled in a water bath for thirty minutes. The floccules that form are removed by filtration through a sterile gauze filter. From 6 to 10 cc. is then injected into the gluteus maximus. At the later injections from 10 to 15 cc. is administered. In all, the patient requires from two to four injections. They are given at intervals of from three to four days. Several hours after the injection the patient's temperature rises. In the evening it generally reaches from 102 to 104 F. During the night and the following day it subsides again. The injection area is usually somewhat painful. The effect on the bubo is sometimes already noticeable on the day following the first injection. The inflammatory swelling and the pain decrease. In the course of the next two weeks the bubo disappears. In some instances, surgical treatment becomes necessary in spite of the milk injections. However, under the influence of the injection the buboes become less painful and "ripen" much quicker, so that the operation can be performed earlier than in patients who had not received injections. The author states further that milk injections had favorable effects not only on the buboes but also on chancroids and phimosis.

Münchener medizinische Wochenschrift, Munich

76: 2039-2078 (Dec. 6) 1929

Alkaloid Content of Ergot Preparations. K. Schübel and W. Straub.—p. 2039.
Clinical Aspects and Results of Postmortem Examination of Alympho-cytosis. L. R. Grote and B. Fischer-Wasels.—p. 2040.
*Significance of Liver in Natural Defense Against Infections. E. F. Müller and H. Brütt.—p. 2044.
Clinical Examination of Muscle Tonus. K. Zucker.—p. 2046.
*Bacteriologic Examination of Scarlet Fever Streptococci. E. Fauvet.—p. 2048.
Constitution as Guide in Prophylaxis and Treatment of Sterility. R. Amersbach.—p. 2049.
Abscess of Testis in Gonorrhea. E. Langer.—p. 2051.
First Aid in Sport Injuries. K. Gebhardt.—p. 2053.
Evidence Against Danger of Schistosomiasis Endemics in Germany. G. Praetorius.—p. 2055.

Significance of Liver in Natural Defense Against Infections.—Müller and Brütt studied the behavior of the various organs following dissemination of bacteria into the

blood stream. In a series of tests they determined that bacteria which are injected into the peripheral blood disappear much later from the blood stream than those which are injected into the mesenteric vein communicating with the portal vein. In the first instance several hours is required, while in the latter case only from ten to thirty minutes is necessary. When the blood is again free from bacteria, all organs with the exception of liver, spleen and bone marrow are also free. It is known that the latter organs, as part of the reticulo-endothelial apparatus, retain the micro-organisms and thus purify the circulating blood. Moreover, the authors found that the liver not only absorbs the bacteria but also aids in their elimination. Several minutes after the micro-organisms had been injected into the blood stream, they were already found in the biliary tract and especially in the gallbladder, and from there they passed into the duodenum. Because other organs, as for instance the kidneys, eliminate micro-organisms only if they are in a diseased condition, this function of the liver appears to be a special physiologic measure of great significance for the organism's natural defense against septic infections. However, in case of insufficiency of the liver, sepsis usually has a fatal outcome. Additional proof that in case of bacterial dissemination the liver really exerts this absorbing and eliminating function was furnished by Petersen. He found that in animals in which the function of the liver had been excluded or in which the organ had been extirpated, the bacteria remained in the blood stream.

Bacteriologic Examination of Scarlet Fever Streptococci.—Fauvet points out that as yet there is no standard method for examination of scarlet fever streptococci. He reviews the investigations by Dold and Müller who employed various kinds of blood agar, and who came to the conclusion that an agar containing 5 per cent of defibrinated and not washed blood of sheep is the best culture medium. Further, the author describes his own tests. First he employed agar containing human blood, and later he made control examinations with agar containing sheep's blood. He comes to the conclusion that human blood agar is somewhat superior to the agar containing sheep's blood. As a standard culture medium for scarlet fever streptococci, he recommends an agar containing 5 per cent of freshly withdrawn and not defibrinated human blood. In the second part of the article the author criticizes the practice of making only pharyngeal smears in scarlet fever. He considers it necessary to make smears from the nose also. He examined pharyngeal and nasal smears of 268 persons. In 201 cases both smears gave negative results; in twelve instances both were positive, in forty-one persons the pharyngeal smear gave positive results, while the nasal smear was negative. However, in fourteen patients, scarlet fever streptococci were cultivated from the nasal smears, while the pharyngeal smears gave negative results.

Wiener klinische Wochenschrift, Vienna

42: 1589-1620 (Dec. 12) 1929

*Heart in Relation to Arterial Hypertension. H. Kahler.—p. 1589.
Nature of Malformations. G. B. Gruber.—p. 1591. C'en.
*Production of Tumors with Blood of Animals with Tumors. B. Lipschütz. —p. 1593.
*Poisoning Caused by Large Dose of Acetylsalicylic Acid. H. Krasso.—p. 1594.
*Pathogenesis, Diagnosis and Treatment of Urolithiasis. T. Hryntschak. —p. 1598.
Treatment in Cholera Infantum. A. Reuss.—p. 1603.
Visual Disturbances Indicating Hypophyseal Tumors. K. Safař.—p. 1604.

Heart in Relation to Arterial Hypertension.—Kahler points out that whereas in former times the condition of the heart was considered the main factor in the development of hypertension, in recent years most authorities are inclined to see the cause of hypertension in changes in the peripheral vessels. However, the author directs attention to the fact that there are also forms of central hypertension which are caused by an increased cardiac activity, which in turn is induced by the vasomotor centers. The great significance of the heart in the pathogenesis of hypertension is also proved by the fact that hypertrophy of the ventricles and other cardiac symptoms are found in many patients with hypertension. The author further discusses the symptomatology and the differential diagnosis in the various forms of hypertension.

Production of Tumors by Means of Blood of Animals with Tumors.—Lipschütz reasoned that because it had been possible to transmit sarcoma from one animal to another by means of ascites fluid, it would, perhaps, also be possible to transfer tumors by means of the blood of animals with tumors. Eight mice were given a subcutaneous injection of blood from mice which fifteen days previously had been inoculated with sarcoma. In two of them tumors developed which had the same structure as the tumors of the animals from which the blood had been taken. Later, blood from these two mice was injected into twelve other animals, but all of them remained healthy. The six animals of the first group that had not developed tumors from the injection of blood were later inoculated with sarcoma cells and now malignant growths developed. This indicates that the injection with blood had not effected an immunity. The author made experiments on two other groups of mice. Of eleven animals that had received an injection of blood from animals with tumors, only one developed a tumor. After describing the technic of these experiments the author discusses the occurrence of tumor cells in the blood. The fact that occasionally it is possible to transmit a tumor by means of blood proves that, at times, tumor cells circulate in the blood stream. It has also been observed that metastases nearly always show a connection with the blood vessels. In conclusion the author discusses whether blood from patients with cancer is likely to cause such growths in persons, for instance surgeons, who come in contact with it. Experiences in thousands of cases seem to contradict this possibility. However, the author reviews one case from the literature in which an infection with a cancerous transudate led to the development of a sarcoma.

Poisoning Caused by Large Dose of Acetylsalicylic Acid.—In the first part of the article Krasso directs attention to the fact that, following medication with salicylic acid, anaphylactic manifestations such as exanthems and hyperthermia often occur. He then reports a case of poisoning in a woman, aged 25, who, in an attempt to commit suicide, had taken sixty tablets, or 30 Gm., of acetylsalicylic acid. The author describes the symptomatology and treatment in this case and reviews similar cases from the literature. He then discusses the prognosis and treatment in cases of poisoning with salicylic acid.

Pathogenesis, Diagnosis and Treatment of Urolithiasis.—In discussing the pathogenesis of urolithiasis Hryntschak first explains certain factors in the chemical composition of the urine. He thinks that disturbances in the colloid content of the urine may cause a precipitation of certain salts contained in the urine. The crystals thus formed may, under certain conditions, lead to the development of calculi. Disturbance in the colloid content and retention or infection of the urine are probably the most significant etiologic factors in urolithiasis. However, constitutional factors, as well as mode of living, namely, diet, fluid intake and occupation, are likewise of some significance. The author also points out that a trauma may cause urinary calculi. Such "traumatic" calculi develop when an incrustation forms around a coagulum. Urolithiasis has likewise been noted after bone fractures, and after fractures of the spinal column with injury of the spinal cord. In the second part of the article the author discusses the various types of urinary calculi. He describes the urate calculus, the oxalate calculus, those that consist mostly of phosphates and of carbonates, the cystine and the xanthine and finally the fibrin calculi. As significant for a correct diagnosis of urolithiasis the author stresses the following factors: a careful anamnesis, bimanual examination of the region of the kidney, careful microscopic and chemical examination of the urine and particularly cystoscopy, chromocystoscopy, catheterization, pyelography and pyeloscopy. The therapy of urolithiasis is discussed from various aspects. The author describes special treatments for cases in which the disease affects only one side, for those in which the process is bilateral, and for patients who previously had undergone nephrectomy. The presence or absence of an infection is likewise a factor to be considered in deciding on the therapeutic method. Whether operative treatment is required, or whether internal treatment is indicated, is sometimes determined by the size of the calculi. Small calculi sometimes are eliminated spontaneously. However, if they do not enter into the ureter, and perhaps cause severe hemorrhages,

operative treatment is indicated. Of the various surgical methods the author mentions pyelotomy, nephrotomy and nephrostomy. Nephrectomy is performed only in extreme cases. The author directs attention to the danger of relapses and he also gives advice for the after-treatment. The dietary after-treatment has to be adapted to the individual case. Persons with urate calculi should be given foods that tend to make the urine alkaline; acidity is to be avoided. In cases of oxalate calculi, foods containing oxalic acids are to be excluded from the diet. If the calculi contain mostly phosphates and carbonates the calcium and magnesium content should be kept low, and acidity of the urine should be induced by the diet as well as by medicinal treatment.

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73: 5677-5832 (Dec. 7) 1929

Peculiar Triplets. C. de Lange.—p. 5678.
*Pregnancy Test of Zondek and Aschheim. M. C. Westermann.—p. 5686.
Criminality in Children. E. A. D. E. Carp.—p. 5693.
Genesis of Malformations: Microcephalia. H. C. Jelgersma.—p. 5700.
Very Mild Cases of Smallpox and Their Significance for Spread of the Disease. C. L. de Jongh.—p. 5709.

Pregnancy Test of Zondek and Aschheim.—Westermann describes the method proposed by Zondek and Aschheim as follows: Catheter urine of the examinee, if necessary made slightly acid with acetic acid and (if cloudy) filtered, is injected into young (preadult) female mice weighing from 6 to 8 Gm. Four such mice receive subcutaneous injections in the back, in the following manner: first day, two injections of 0.4 cc.; second day, three injections of 0.4 cc.; third day, one injection of 0.4 cc., and fourth day, no injection. On the fifth day, the mice are killed (likewise a control mouse, of the same weight, which receives no injection), and the uteri and ovaries are laid open. Zondek and Aschheim distinguish the following forms or degrees of reaction: reaction I: maturation of follicles in the ovaries, enlargement and swelling of the uterus, and rutting changes in the vagina; reaction II: hemorrhages of the follicles, which are manifested as reddish brown blood spots on the surface of the ovary, and reaction III: formation of corpora lutea, in which often the ovum can be found; atretic corpora lutea, which appear as minute white points on the surface of the ovary. If in one or more of the mice receiving the injections reaction II or reaction III is observed, the pregnancy test is positive. Reaction I alone is not sufficient, as this reaction is observed in rapidly developing benign tumors and in cases of carcinoma. In cases in which the diagnosis is doubtful macroscopically, the ovaries are cut into thin sections and examined microscopically. In summary, Westermann states that he applied the method described to nine patients in whom pregnancy was fully established and they all gave a positive reaction. Twenty patients in whom pregnancy could be excluded gave a negative reaction. In four cases he was able, with the aid of the test, to give an exact diagnosis.

Finska Läkaresällskapets Handlingar, Helsingfors

71: 871-966 (Nov.) 1929

*Methods of Measurement of Lytic Strength of Bacteriophage Broth. H. Bergstrand.—p. 871.
*Significance of Changes in Spleen in Familial Hemolytic Jaundice. E. Sjövall and G. Ivarsson.—p. 886.
Freezing Point and Xanthoprotein Reaction in Blood in Cancer Patients. B. Runeberg.—p. 905.
Roentgen Observations Concerning Osteochondritis Dissecans. G. Jansson.—p. 914.
*Lichen-Ruber-Corneus-Like Arsphenamine Exanthem or Lichen Ruber Corneus? C. Thesleff.—p. 938.

Methods of Measurement of Lytic Strength of Bacteriophage Broth.—Of the three methods tested, the plate method, D'Hérelle's method of counting the clear spaces, and Appelman's so-called dilution method, Bergstrand found the last named the simplest, and, properly done, the most exact.

Significance of Changes in Spleen in Familial Hemolytic Jaundice.—Sjövall and Ivarsson's anatomic investigations on the structure and functional activity of the spleen continue the analysis published by Hellström (1916). Their material comprises three of Hellström's cases and four new cases; four cases belong in the same family, two are in sisters, and in the last case the father had probably had familial hemolytic jaundice. They found a constant hyperplasia, chiefly localized in the reticular pulp and of normal type, and a definite tendency to congestion of the red corpuscles in the intersinusal spaces of the reticular tissue. The theory of a genotypical change in the erythrocytes seems to them satisfactorily to explain the definite heredity of familial hemolytic jaundice and to interpret the changes in the spleen in this condition. Splenectomy eliminates the organ which, in agreement with Hellström's conception, especially contributes to transform the anomaly present into a disease.

Lichen-Ruber-Corneus-Like Arsphenamine Exanthem or Lichen Ruber Corneus?—In Thesleff's case an exanthem clinically and histologically corresponding to lichen ruber corneus or lichen ruber verrucosus developed on the front of the lower part of both legs after a grave arsphenamine intoxication with general dermatitis.

Hospitalstidende, Copenhagen

72: 1055-1086 (Oct. 31) 1929

*Intrathoracic Goiter with Recurring Disturbances in Respiration in Several Pregnancies: Case. A. Buch.—p. 1058.

Intrathoracic Goiter with Recurring Disturbances in Respiration in Several Pregnancies.—In Buch's patient, a multipara in the fourth or fifth month of pregnancy, with slight, diffuse goiter and a history of difficulty in breathing for seven years, pronounced only in the several pregnancies, operation revealed a cyst of hen's egg size behind the sternum, which was enucleated from the thyroid gland. Puerperal fever nine years earlier is thought to have been an etiologic factor. The occurrence of the compression symptoms early in pregnancy is believed to depend on the correlation between the thyroid gland and the ovarian functioning.

72: 1067-1076 (Nov. 7) 1929

*Influence of Congenital Syphilis on Pregnancy, Delivery, Puerperium and Later Fate of Children. H. Boas and T. Sodemann.—p. 1067.

Influence of Congenital Syphilis on Pregnancy, Delivery, Puerperium and Later Fate of Children.—In thirty-nine mothers with established congenital syphilis, and fifty-five pregnancies, Boas and Sodemann found no evidence of increased danger to mother or child in pregnancy and delivery. Albuminuria of pregnancy occurred more frequently but was always mild, transitory and as a rule nonrecurrent. Of the thirty-seven children observed for from four months to seventeen years, all were clinically and serologically without syphilis; necropsy in four infants showed no signs of syphilis; two cases were abortions; in thirteen children not examined afterward there were no signs of syphilis at birth. In spite of these results intensive treatment during pregnancy, especially with arsphenamine, is advised for every patient with congenital syphilis.

72: 1077-1102 (Nov. 14) 1929

*Possible Existence of Two New Blood Types: Also Contribution to Knowledge of So-Called Undertypes. O. Thomsen, V. Friedenreich and E. Worsaae.—p. 1077.

Possible Existence of Two New Blood Types: Also Contribution to Knowledge of So-Called Undertypes.—Thomsen et al. state that the blood corpuscles of types A and AB differ in different persons in their ability to bind α-agglutinin. Two sharply differentiated types are revealed, A, binding about 80 per cent, and A', binding about 20 per cent; there are no intermediate forms. The method of differentiation consists in (*a*) a preliminary test with partly absorbed Anti-A serum and (*b*) a determination of three points in the absorption curve. On the basis of family investigations the following hypothesis is presented: Instead of three allelomorphic germinal factors there are four, called O, A, A', B, in which A is the gene for the strongly binding receptor type, A' the gene for the weakly binding. There is but one agglutinin, α (Anti-A), which is, with differing intensity, bound by A and A'. There are thus ten coordinate genotypes and six phenotypes. With regard to dominance the new factor, A', in the main resembles A. With the technic used the phenotypical differentiation between A and A' holds only for adults; the majority, at all events, of the new-born of group A will appear as A'.

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